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DISCUSSION
OF THE
METEOROLOGICAL AND MAGNETICAL
OBSERVATIONS

MADE AT THE
FLAGSTAFF OBSERVATORY, MELBOURNE,
DURING THE YEARS 1858 — 1863.

BY
GEORGE NEUMAYER, PH. D.,
LATE DIRECTOR OF THE FLAGSTAFF OBSERVATORY, MEMBER OF VARIOUS SCIENTIFIC SOCIETIES.



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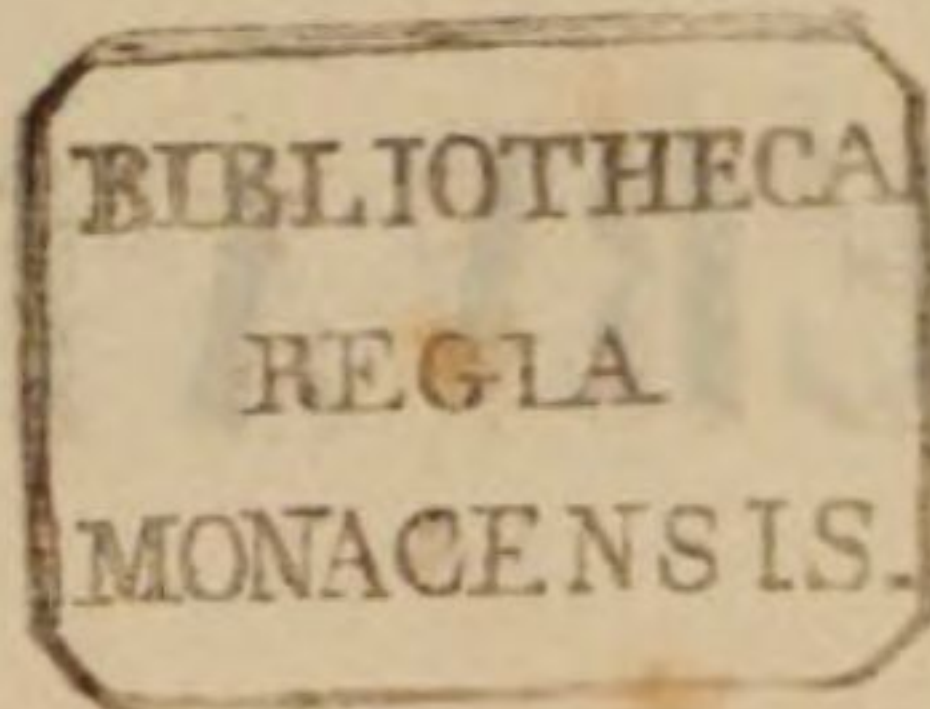


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GEORGE MEYER, P.H.D.

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P R E F A C E.

It is now exactly ten years since the construction of the Observatory on the Flagstaff Hill was first set on foot; and nearly five years have elapsed since the discontinuance of the systematic registrations, forming the subject matter of the discussions embodied in this volume. During this time the Observatory has issued three publications, the last of which, the present volume, may justly be termed a complete *resumé* of the results of the systematic labours carried on during five years at the Flagstaff Observatory; whereas the two former volumes contain mainly abstracts on magnetical and meteorological observations made at Melbourne and other localities in the Colony.*

In the Prefaces to Vols. I. and II. I have given short sketches of the history of the Flagstaff Observatory, and have also set forth the reasons prompting me in framing their plan and scope; and it remains now but to express, in a few sentences, the reasons by which I have been guided on the present occasion, and to allude in short to the circumstances which have exerted an influence upon the progress of this work.

In the Preface to Vol. II., p. vii., I have stated, that the Board of Visitors to the Observatory could originally not arrive at a definite opinion as to the form in which to publish the results of the hourly observations, wherefore they finally decided that it should be left to the President of the Royal Society and the Committee of the British Association to determine the form and extent of the volume.

* The second volume contains, in addition, discussions on the nautical part of the labours of the Observatory, as at the time it was thought of special importance to put these results without any delay in the hands of nautical men. Frequent references occur throughout the present work to the above two volumes, which are made by means of the abbreviations "R. I.," "R. II.," ("Results, Vol. I.," "Results, Vol. II.")

Immediately after my arrival in Europe, in September, 1864, I placed myself in communication with the Committee of the British Association, then assembled at Bath, from whom I learnt that they considered it the most effectual means of furthering my objects and the ends of the Board of Visitors, to delegate the authority of the decision upon the President of the Royal Society. I accordingly took an early opportunity of laying the entire observations before General Sabine, in order to afford him a means of forming an opinion as to the best mode of turning these extensive labours to account. The result of these negotiations was, that I undertook the onerous task of subjecting my magnetical and meteorological observations to a complete discussion, the results of which were to be published as early as circumstances would admit, it being made a point, however, that I should include as much of the original observations in full as the means at my disposal would allow. This arrangement formed the base in determining the scope and extent of this volume. How far I have succeeded in doing justice to the task I have undertaken, I may safely leave to scientific men to decide. I may, however, state that I have spared no pains in order to make myself acquainted with the views of the principal authorities in the various branches of science, which this volume is calculated to assist in developing; and that, in many instances, I have met with the most cordial support in arriving at conclusions as to the best method of acquitting myself of the task I have just completed. It is but right that I should here express my sincere thanks, for assistance thus received, to Lieut-General Sabine, and Professors Lamont, Peters, and Heis, who were ever ready with valuable suggestions to assist throughout the execution of this work.

I regret to say that the means at my disposal would not allow of my including in this volume a larger number of original observations on terrestrial magnetism, though I was particularly anxious that the complete registrations on the magnetic inclination should be placed in the hands of those interested in this branch of science, as has been done with respect to the records on magnetic declination and horizontal force. Such a course would, however, have necessarily involved too great a sacrifice on my part to warrant me in adopting it.

There is scarcely any necessity for adding any further remarks respecting

the plan I have followed in these discussions, as in the introductory remarks preceding each of the two separate parts, I have given as clear an insight into this matter, as is requisite for a complete understanding and appreciation of the subjoined results. I may likewise be permitted to refer to Vols. I. and II., where, as already mentioned, many points have been explained which must necessarily be of weight in judging of the value, from a scientific point of view, of the present volume.

As, in the erection and working of the Observatory, I had to encounter great obstacles, especially in the case of the observations on terrestrial magnetism, so in like manner was the commencement of the printing of the present volume surrounded with considerable difficulties. Scarcely had the manuscript been placed in the hands of the printer, in May, 1866, when the excitement of the late war upset every arrangement, and it was even a matter of considerable difficulty to procure the necessary compositors for the continuation of the work. Frequent interruptions and unavoidable delays were the necessary consequences of the unfortunate events of the year 1866. Moreover, it was next to impossible, unless prepared to meet considerable sacrifices, to procure competent assistance in the reading and correcting of the proof sheets, which, in passing a work through the press in a foreign country, is of special importance. Thus it has happened that, in the early part of this book, many mistakes have crept in, which, under other circumstances, would have been equally well avoided as in the latter part. I have refrained from including such merely literal mistakes in the table of errata attached to the end of this volume, as they in no way interfere with the sense of the respective passages in which they occur; and have confined myself to the enumeration of such errors as are of intrinsic import. For these almost unavoidable mistakes the difficulties under which I laboured at the time of the commencement of the printing of the work must be my best apology.

I cannot conclude these introductory remarks, without expressing my sense of appreciation of the kind manner in which Lieut-Colonel C. Pasley (R.E.), to whom the business and financial arrangements connected with this work, were entrusted by the Government of Victoria, has ever responded to the wishes with which I was obliged to trouble him at various times; and I now place this

volume in the hands of the scientific world, hoping that it will meet with a favourable reception, and that I shall have succeeded in doing thereby honour to the liberal manner in which the people and legislature of Victoria have ever shown themselves ready to further the ends of science.

G. N.

FRANKENTHAL,

October 1867.

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PART I.

METEOROLOGY.

FLAGSTAFF OBSERVATORY.

37°48'45" South Latitude.
9^h 39^m 53^s East Longitude.
120·7 feet above the level of the sea.

MELBOURNE OBSERVATORY.

37°49'54" South Latitude.
9^h 39^m 58^s East Longitude.
91 feet above the level of the sea.

. Subsequent and more accurate determinations, by Mr. *Ellery*, place the Melbourne Observatory in 37°49'33" South Latitude and 9^h 39^m 34^s·8 East Longitude.

INTRODUCTION.

A DISCUSSION of meteorological observations of such completeness, as those made at the Flagstaff Observatory in the years 1858—1863, ought to be carried out with the primary view of assisting every branch of meteorological science in its developement. To do justice to this involves the execution of a task of immense extent, as it necessarily implies the complete reduction and computation of an extensive meteorological journal. Inasmuch as it has carefully to avoid all theoretical speculation, tending to expose ones mind to the dangers of preconceived opinions and ideas, and has to confine itself to the arranging of the results of the discussion in such a manner as to make them at once available for theoretical inquiry, it is also a task of considerable selfdenial. For it is, no doubt, more gratifying to enter upon an examination of the principal features of a climate, as delineated by the various meteorological elements, with the object in view to bring them into accord with the general meteorological system and the results of physical geography. But for such a purpose a far less elaborate system of observations, carried through in one and the same locality, is required, than in our case; and when once the question was decided, that it was desirable to have the observations subjected to a rigorous inquiry, in preference to a publication of the same in full, I resolved to take as extensive a point of view in carrying this into execution, as was recommended by the interest of meteorological science, and by the imperfect state of our evidence in support of the theoretical views almost universally adopted. The number of completely reduced and calculated journals, relating to meteorological facts and collected in the Northern hemisphere, is, comparatively speaking, still very small; while for the Southern hemisphere there are, to my knowledge, none at command for the use of those whose special study it is, to establish strictly philosophical foundations for meteorological science. And I do not suppose that there can exist a difference of opinion, that it is only by comparative discussions of a great many more completely reduced and calculated meteorological registers, that we can hope for a satisfactory solution of the various problems still standing in the way of attaining the end just indicated.

In deciding upon the plan for the present publication on the meteorological labours of the Flagstaff Observatory, I was therefore principally guided by the idea that it was most desirable to devote my attention to the examination of the annual and diurnal variation in the various meteorological elements, and to investigate into the change of these elements, as far as it depends upon the wind's direction. With a view to facilitate the comparison of the results of the single meteorological elements among themselves, and with those derived from other stations of observation, the several points were discussed in the same order, and all matter, not strictly required for the understanding of the deductions, was separated from the main body of the evidence adduced, and was embodied in the Appendix. With respect to this latter point, particular care was bestowed upon the selection of the tables, so as to complete the various sets of tables already published on former occasions. By this manner of procedure a complete series of abstracts is placed in the hands of those desirous of entering more fully upon an examination of the evidence, forming the base of the deductions, thereby replacing to a great extent the original observations in full.

Several topics, capable of being treated in a more explicit manner with the object of eliciting truths hitherto unknown, are merely given in abstracts, calculated to facilitate a further and strict inquiry, as, for instance, the "Lunar diurnal variation of the Barometer;"* others again, where on account of the great quantity of material, having an immediate bearing on the final conclusions, abstracts would have scarcely answered the purpose, are treated more exhaustively. Among the latter are: "Aqueous vapor and Terrestrial radiation" and "Meteors." According to the most recent researches, observations and discussions of observations on meteors will henceforth have to be received in publications on astronomical matters, and their appearing in this meteorological discussion will have to be accounted for by the novelty of the discoveries, leading to the knowledge of the true nature of those bodies.

After these introductory remarks, I shall proceed with delineating the leading principles followed in carrying out the present discussions.

The Wind's mean direction and resultant were computed by the formulae, explained on several occasions, in spite of the many objections which have been raised of late against this mode of representing the mean motion of the air. The principal authorities on meteorological matters regard it still as an excellent means for forming a comprehensive idea thereon, and as being preferable to any of the other modes hitherto proposed, though there is no doubt that in some respects these objections are not quite unfounded. The results embodied in the present volume are in themselves most effectual proofs of the aptitude of the wind's mean direction for theoretical investigation. Other questions, bearing upon the wind, its force, relative frequency, and law of gyration, are treated in the first chapter, thereby considerably facilitating the inquiry on the wind's influence upon, and relation to, the various meteorological elements.

With respect to these, the following order is adopted: II. Pressure of air, III. Temperature of air, IV. Pressure of aqueous vapor and some facts in connexion with relative humidity, V. Pressure of dry air, VI. Atmospheric Electricity, VII. Amount of cloud, VIII. Temperature of

* A full investigation on the various phenomena connected with this subject, as far as regards the Melbourne observations, was embodied in a paper entitled: "Lunar Atmospheric Tide at Melbourne," read before the Royal Society, and printed in their "*Proceedings*."

soil on the surface and under ground, IX. Aqueous meteors (A. Rain, B. Spontaneous evaporation, C. Dew, and D. Fog).

Annual March. If S signifies any of the meteorological elements, n the number of the month commencing with the 1st of January, the annual march is expressed by the following formula of Bessel:

$$S^{(n)} = s^* + u' \sin \left\{ (n + \frac{1}{2}) 30^\circ + v' - 15^\circ \right\} + u'' \sin \left\{ (n + \frac{1}{2}) 60^\circ + v'' - 30^\circ \right\} + u''' \sin \left\{ (n + \frac{1}{2}) 90^\circ + v''' - 45^\circ \right\} + \dots$$

By the aid of this formula, the monthly mean values for each element are computed and compared with the actual mean values observed, thereby affording a means for testing the reliability of the formula.

With a view to determine the dates, when the extremes occur, we employed the following equations:

$$\frac{dS^{(n)}}{dn} = 0 = u' \cos \left\{ (n + \frac{1}{2}) 30^\circ + v' - 15^\circ \right\} + 2 u'' \cos \left\{ (n + \frac{1}{2}) 60^\circ + v'' - 30^\circ \right\} + 3 u''' \cos \left\{ (n + \frac{1}{2}) 90^\circ + v''' - 45^\circ \right\} + \dots$$

In the course of the calculation it was found quite indispensable to take also the third term into account, as a neglecting of the same would lead to results, inadequate to the importance of the questions to be treated, and in some cases even involving considerable uncertainty.

Diurnal Fluctuation. The formula employed in this case for expressing the diurnal fluctuation in any of the meteorological elements is

$$S^{(n)} = s + u' \sin (n 15^\circ + v') + u'' \sin (n 30^\circ + v'') + u''' \sin (n 45^\circ + v''') + \dots,$$

commencing with noon (0^h), and ending with 11^h a. m. (23^h).

Also here the values for the several hours of the day are computed according to the proposed formula, and the results are compared with actual observations. For the purpose of ascertaining both time and value of the extremes in diurnal fluctuation for every element, the following formula is used:

$$\frac{dS^{(n)}}{dn} = 0 = u' \cos (n 15^\circ + v') + 2 u'' \cos (2n 15^\circ + v'') + 3 u''' \cos (3n 15^\circ + v''') + \dots$$

Windroses The preliminary computations have in this case been executed according to the same principles as in the former cases; in every element the means for every point of the compass and for every one of the years of observation have been derived, and these means have been again combined to one general mean. Thus we obtained monthly tables exhibiting the dependence of the various meteorological elements on the wind's direction; but as it was intended to construct quarterly windroses, and as the number of observations was not equal for the various points, we used the method proposed by M. Kämtz, in order to eliminate the irregularities consequent upon the construction of the monthly tables, just alluded to.

If M is the simple mean for a quarter, C the correction to be applied, we have the corrected quarterly mean $M_0 = M + C$. For the determination of C , we have:

$n', n'', n''', \dots$ number of observations during the single months forming the quarter.

$m', m'', m''', \dots$ means for the single months, derived from all observations.

$a', a'', a''', \dots$ mean values for the resp. element for a certain direction of the wind during the single months forming the quarter; and therefore

$$C = \frac{(a' - m') n' + (a'' - m'') n'' + (a''' - m''') n'''}{n' + n'' + n'''}$$

* The value s represents the monthly or yearly mean of any element, and will differ, in most cases, from the actual monthly or yearly mean.

By means of this formula the values for the single directions of the wind were reduced in such a manner as if all had been derived from an equal number of observations. It remains yet to be mentioned that the wind's direction was originally recorded for every one of the 32 points of the compass; and in order to reduce these notations to 16 points only, the values of the various elements for the intermediate points were divided into two halves, which were thrown to the values of the next adjoining points to be retained.

The formula employed in expressing the law of the resp. windrose is

$$S^{(m)} = u + u' \sin (m 22^{\circ} 30' + v') + u'' \sin (m 45^{\circ} 0' + v'') + \dots,$$

in which m signifies consecutively $0 = S$, $1 = SSE$, ..., $15 = SSW$.

For the determination of the maxima and minima, we employed the formula

$$\frac{dS^{(m)}}{dm} = 0 = u' \cos (m 22^{\circ} 30' + v') + 2 u'' \cos (m 45^{\circ} 0' + v'') + \dots,$$

and for the mean values,

$$0 = u' \sin (m 22^{\circ} 30' + v') + u'' \sin (m 45^{\circ} 0' + v'') + \dots$$

By the aid of the first formula, the values for each of the sixteen points of the compass were computed and compared with the actual observations, the differences between both values being adopted as a criterion for the reliability of the method employed in arriving at the proposed formulae.

In the determination of the points and values of the maxima and minima, as also the mean values within the windrose, the third terms of the equations have been neglected.

All other points of interest in the present discussion will be explained in the course of the treatment of the single elements.

Table 3 of the Appendix. Penthemeral outlines, derived from a long continued series of observations, afford an excellent means for arriving at conclusions respecting the mean values of the meteorological elements, and their oscillations within shorter periods, and throughout the year. They form at the same time the only sound basis for weather-prognostics, supposing the meteorology of a great tract of land were represented in tables of this kind; and, as far as a peculiarity of a climate is merely of a local character, they are likewise the surest guides through the labyrinth of the intricate phenomena which puzzle at present the skill of meteorologists, and frustrate their efforts in this direction. A clear understanding of the connexion of meteorological phenomena among themselves, and a distinct delineation of the frame, within which the meteorology of a country, or place, moves during so short a period as five days, are the primary conditions for a marked advance in our science, alike with regard to theoretical speculation and practical application. For this reason we strongly recommend the construction of similar tables for other localities; and even if they should not embrace a longer series of observations than five years, as in our case, they will still be of the greatest value, for even then the various values of each penthemeral period bear the weight of those for $\frac{5}{12}$ th of a month.

The first 14 columns are occupied by the five-day means, the means of the daily and periodical extremes, and the five-yearly absolute maxima and minima in temperature and pressure of air. Next, we notice the means in pressure of dry air and vapor, temperature of dew point and relative humidity; then the means for daily duration of fog, dew, hail, and rain, as also the mean daily amounts of rain and spontaneous evaporation. Further, we find

in this table the mean temperatures of the water in the evaporation-guage and the surface-soil, and the means of twenty-five maximal and minimal readings of the radiation-thermometers and of the amount of cloud. The mean direction and resultant of the wind, inserted in our table, are derived from 600 notations of the wind's direction and force, which is likewise the case with the mean force. The four columns next to it show, on how many days the daily mean direction happened to fall within each quadrant, thus furnishing a means of judging of the stability of the wind's direction. Another column indicates the number of days on which gales occurred, the general direction being enclosed in brackets; another shows the number of days on which thunderstorms and lightning were recorded. To avoid fractions, we subjoined in these cases the total number for 25 days of observation. This series of elements of meteorological outlines is concluded by the mean positive tension, the mean daily number of negative and zero registrations in atmospheric electricity, and the mean ozonic reaction.

Table 4 of the Appendix gives the monthly outlines of the principal meteorological elements in a similar manner to that just described for five days; it therefore scarcely requires any farther explanation.

The remainder of the tables in the Appendix are also easily understood.

EXPLANATION OF DIAGRAMS.

Tables 1 and 2 complete the series of similar plates, already published in R. I. and R. II., and illustrate the principal meteorological features for January and February, 1863.

Table 3 contains the curves representing the annual march in temperature of air and of the ground at various depths, as also of the pressure of vapor. They have been constructed by the aid of the calculated values. The abscissae are the distances in time from the 1st of January; the middle of every month is marked by a heavy line of the length of the calculated ordinates. For the temperature curves one part of division is equal to two degrees, while in the case of pressure of vapor 2 parts of division are equal to 0.1 inch. The minimum of the oscillation is the axis upon which the curve was constructed, and this minimum value is in each separate case written in the column to the right, and close to the end of the resp. axis.

The results of the determination of the turning points are in this, as in all other curves of this volume, indicated by round dots.

The annual march of the temperature of air and surface soil, and of the pressure of aqueous vapor is, in addition to the curves of monthly means, represented by the penthemeral mean values. For this purpose our diagram shows 73 subdivisions, independent of the division into months. We notice that there are still considerable deviations, which, there is no doubt, would have completely disappeared, had a longer series of observations been made use of.

The extremes in temperature of surface soil precede those in temperature of air by 6—9 days, but the underground-thermometers show the retardation in the occurrence of the extremes with the increase in depth, so that, in about 6 or 7 in. below the surface, the maximum and minimum take place simultaneously with those in the air; the range for the curve of temperature of air is about the same as that for the temperature 80 inches below the surface.

Table 4. The principles of construction are in this case the same as those applied in Table 3, and do not require any special explanation. The minimal values are inserted in the column to the left, and the single elements are:

Pressure of air and dry air, one part of division equal to 0.1 in.

Positive atmospheric electricity, two parts of division equal to one part of the Electrometer.

Force of wind, 0.5 part equal to 0.1 part of Beaufort's scale.

Amount of cloud, 2 parts equal to 1.0 part of the scale "1 to 10."

Duration of rain, 0.5 part equal to 0.1 hour.

The penthemeral means are only shown in the diagram for pressure of air.

There exists a great similarity between the curves for pressure of air and atmospheric electricity, a similarity which I have already taken occasion to point out in former publications. The periods of maximum nearly coincide;

in the case of the gaseous pressure and atmospheric electricity, they are almost identical; a greater difference is noticeable with regard to the periods of minimum. The separation of the aqueous vapor from the pressure of air, both elements showing an opposite character in respect to their annual march, has the effect of causing the extremes in gaseous pressure to be retarded by about 6 or 8 days.

The curve for force of wind shows a decided minimum in the beginning of April, while the maximal period is by no means clearly expressed, September and January being alike remarkable for a high force of the wind. In the case of the amount of cloud, there is a great regularity in the annual curve observable, and although the annual curve for daily duration of rain naturally runs in some measure parallel to the one for amount of cloud, we notice a striking deviation from it in the months of August and September, from which we feel inclined to draw the conclusion that at this time of the year obscurity of the sky is mostly accompanied by a fall of rain.

Table 5. Horary variation in pressure of air and dry air. These curves exhibit the diurnal oscillation from midnight to midnight, and again to 7^h a.m., for every month and for the year. The minimum of the oscillation is in each case adopted as the axis on which the curve is constructed; the value corresponding to this minimum is entered in the column to the left, close to the end of the resp. curve. The turning points exhibit in a clear manner the annual change in their position. One part of the division is equal to 0.01 in., and it may be again repeated that these, like all other curves, are drawn by the aid of the calculated values; the same applies in respect to the extremes. The annual curves are indicated by dark lines.

Table 6. Horary variation in temperature of air. One part of division is in this case equal to one degree, the remarks bearing on the construction of these curves generally, and made in respect to the curves of the last table, apply also here, and in the curves for horary variation following.

Table 7. Horary variation in pressure of vapor and positive atmospheric electricity. In the first case one part of division is 0.01 inch, and in the second 1.0 part of the Electrometer.

With respect to the maximum in diurnal variation of pressure of vapor, we notice a marked difference between the several months throughout the year. From April to August the maximum occurs about noon, either before or after; September and October seem to be undecided with regard to this point, while from November to March the increase of tension in aqueous vapor seems to continue until about sunset. The greatest regularity in the diurnal variation seems to prevail during June and November, both months representing the prototypes of the two main classes of curves.

The character of the curves for horary variation in atmospheric electricity resembles mostly that for pressure of air and dry air, a fact which is the more interesting because we have already pointed out that a great resemblance exists with respect to the annual march of these meteorological elements. This comparison may even be extended to the annual change of the turning points, the minimum in the afternoon forming the only exception. The annual curve shows distinctly that the primary maximum and minimum take place in the morning and afternoon respectively, as in the case of the pressure of air. The difference between the primary and secondary maximum is, in both cases, in the summer months less than during the winter; in the case of the atmospheric electricity, the afternoon maximum is in excess of that in the forenoon during the months of February and March. The coincidences pointed out bear rather the character of being causal than merely accidental, and it remains with theoretical speculation to establish the connexion between these two meteorological elements, for we shall presently see that also with regard to the wind's influence both exhibit a similar relation.

Table 8. Horary variation in temperature of surface soil. In this case one part of division is equal to two degrees.

Table 9. Horary variation in force of wind. Here one part of division is equal to 0.1 of Beaufort's scale. We cannot fail to be struck by the great regularity of these curves, derived from observations which were effected by mere estimation. The annual variation in the time of the diurnal maximum moves between the hours 12^h 27^m (September) and 4^h 8^m p.m. (January), while the amplitude of this oscillation is far greater for the time of the minimum (between 4^h 42^m a.m. in January and 6^h 15^m p.m. in July). It was originally intended to examine somewhat closer the hourly increment and decrement of the diurnal variation both for force of wind and pressure of air, with a view to illustrate the influence of the ascending current of air, supposed to be measured by the diurnal change in the force of the wind, on the horary variation of the barometer; but this must be left to a special inquiry, as the limits at our disposal for meteorological matters have been already transgressed. (See pag. 21.)

Table 10. Horary variation in amount of cloud. One part of division is equal to 0.1 of the scale "0—10." The law of variation is, in this case, most distinctly expressed in the months of October to April; from May to September considerable irregularities make themselves manifest.

Table 11. Horary variation in duration of rain. One part of division is equal to 0.01 of an hour. The irregularities are in this element greater than in any of the preceding ones. We may state, however, with certainty that the least chance for rain is between the hours noon and 1^h p.m., while the greatest chance occurs between 1^h and 2^h in the morning. During November, January, and February, the amplitude in diurnal variation of rain is very inconsiderable, i. e., there is no great difference between the 24 hours with regard to disposition for rain, but the minimum is nevertheless most distinctly expressed, as also the maximum, in the case of December, January, and February, the latter exhibiting a state of transition towards the months of March and April.

Quarterly and yearly windroses. In every one of these cases the minimal value is adopted to be zero, and is represented by the inner circle of the windrose; the numerical value of this minimum is inserted within. The mean direction of the wind for the period to which the resp. windrose applies is indicated by a dotted line and an arrow. The turning points are shown by dots.

Table 12. Windrose for pressure of air and dry air. One part of division is equal to 0.010 inch.

Table 13. Windrose for temperature of air and for pressure of vapor. In the first instance one part of division is equal to one degree, while in the second it is equal to 0.01 inch. For the full understanding of these curves we must refer to the remarks made on the local influences, page 80.

Table 14. Windroses for amount of cloud and positive atmospheric electricity. For amount of cloud one part of division is equal to 1.0 of the scale "0—10," and for positive electricity, to one part of the Electrometer. On comparing the windroses for pressure of air and electricity, we find again a great similarity between the two curves, so that now in the three cases examined, annual march, hourly variation, and windrose, this similarity is proved to exist, — a fact which I deem of great interest, and worthy of a more rigorous investigation than it is possible to bestow upon it now, as it seems not to be of a merely accidental or local character, but rather to rest upon a theoretical connexion between the two elements in question.

Table 15. Windrose for frequency and force of wind. The value of one part of division is, respectively, for the quarter $\frac{1}{4}$ th, and for the year $\frac{1}{365}$ th of an hour, and one part of Beaufort's scale. The yearly curve for frequency is somewhat different to the one given in R. II., plate 49, fig. 3, which exhibits greater irregularities, being derived from actual observations without being subjected to a computation according to the method of the least squares, as in the present case.

Table 16. Hourly variation of the mean direction of the wind for every month and the year. These curves are arranged in quarters, the first month in each quarter being distinguished by a full-drawn line, the second by little strokes, and the third by dots. The mean direction for the single months are indicated by lines, distinguished in the same manner as the one just described. The yearly curve is drawn by a heavy line, and on it, as on an axis, perpendiculars are erected exhibiting by their length, given on quite an arbitrary scale, the resultants belonging to a certain hour and mean direction; the extremities of these perpendiculars, situated on both sides of the axis, are again connected by curves. Thus we possess a means of judging at one glance in which position of its daily motion the wind abides longer or shorter, the breadth of the stripe, formed by this process, being the criterion. On plate 49, R. II., Fig. 1., we have the same curve derived from one year (1859) only, and we see immediately that this curve is more regular than the one derived from 5 years' observation; this applies more especially to that part of the curve between 6^h and 8^h p.m. During the hours of the day, there can exist no doubt as to the direct sense of the motion of the wind's mean direction; after 6^h p.m. this motion appears to be rather uncertain, when looking at the yearly curve alone; but on examining the single months, we see that, during the months from October to March, the tropical point towards the South occurs after 6^h p.m., while from April to September this tropical point varies between noon and 6^h p.m. Semi-annual curves would, therefore, most likely be totally free from any such uncertainty. We notice here, too, as in so many other cases, the usual semi-annual division of the year.

Table 17. A small map exhibiting the principal features of the South-east part of Australia, as far as they are of some import for meteorological phenomena. The main mountain-chains are indicated by dark curves,

their breadth bearing a relation to the elevation. The principal rivers are also laid down, as indicative of the country of the extensive plains. A dotted line, drawn from Melbourne towards the N.W. (C) shows the direction of the centre of Australia, and an arrow points out the yearly mean direction of the wind. The lines from Melbourne towards the points A and B embrace the triangular sheet of water between Cape Otway and Cape Schanck, which necessarily influences the windroses for the several meteorological elements.

In the same table we find the curve representing the annual variation of the mean direction of the wind; the change in the resultants is shown in a manner similar to that we pointed out, when speaking of the curve for hourly variation in the wind's mean direction. Besides the monthly mean directions, the penthemeral values also are inserted in our diagram.

Another diagram illustrates the annual variation of amount of rain, indicated by the length of ordinates; of spontaneous evaporation, indicated by a full-drawn curve; and of relative humidity, shown by a dotted curve. The quarterly amounts are likewise represented by ordinates close to those for IV., VII., X., and I., and their upper extremities form the centre of windroses exhibiting the amount of rain for the various points of the compass; the arrow again indicates the mean direction of the wind, and is made to coincide with the ordinate for the resp. quarter, representing the amount of rain. This amount for the several points is given in percents of the total fall for the resp. quarter, and is shown by the length of the radii. Where the mean direction coincides with a full point, the length of the radius is indicated by a little stroke. (See table, page 109.)

Next, we observe a windrose showing the number of minutes of rain for one hour the wind blew from each of sixteen points. The inner circle is to be regarded as a basis for the construction, it being the minimum number of minutes, viz. 2. One part of division signifies here one minute. The quarterly and yearly mean directions of the wind are indicated in the usual manner.

Lastly, we have a diagram, representing the annual variation in the mean direction of the upper and lower currents of air. For the clear understanding of this, we must refer to the table on page 26. The monthly mean directions of the wind are indicated by dots, a full line connecting them with one another; while little stars stand for the mean directions of the upper current, a dotted line establishing the connexion between them. Each ring denotes a month, commencing with XII. (December) and ending with I. (January). This diagram shows very distinctly, whether the upper current is in advance or arrear with regard to the rotation of the current at the surface.

Table 17 a (21) and table 17 b (22) do not require any special explanation, as every point of import for the full understanding of the same will be found explained in the course of the treatise on meteors to which they appertain.

I. WIND.

1. With respect to the manner in which direction and force of wind have been determined, it may suffice to refer for particulars to the previous publications on observations made at the Observatory („Results I.“ page 2 and „Results II.“ page 4 and 110), it remains, however, yet to be remarked that on frequent occasions the results of the notations and the reliability of the various observers were ascertained by comparing the estimated direction and force with the same quantities obtained by the aid of anemometers. During the years 1858 to 1860 Osler's anemometer, original construction, and that of Dr. Whewell were frequently used for the purpose indicated, and when in the beginning of 1861 Mr. Follett Osler visited the Colony and kindly allowed to make use of two anemometers on the velocity principle, chiefly constructed for observations on board the ship in which he made his voyage from England, I availed myself of the opportunity, still further to check the results obtained by estimation. Both anemometers of Mr. Osler were placed on the platform of the roof and were kept in working order from the beginning of February to the end of May 1861. In this way it was ascertained that we may rely on estimation to within a point and even more, as far as direction is concerned, and that with regard to force, according to Beaufort's notation, a satisfactory degree of accuracy may be attained, which will best elicit from the results subjoined hereafter. With respect to this latter point it was not thought expedient, fully to discuss the simultaneous observations bearing on this subject with a view to determine the value of each figure of the scale, expressed in velocity or pressure, as such observations seemed to be too few to allow of their being placed in juxtaposition with the elaborate labours on this topic, published by Mr. Glaisher, and derived from observations made at the Royal Observatory at Greenwich. So much, however, may be stated that the comparisons at our command in the whole confirm the results just alluded to and published by admiral Fitzroy in his weather book (pag. 4 and 361).

After a few modifications, recommended by the mode of observation adopted at the Flagstaff Observatory, the scale for force of wind stands thus:

	BEAUFORT'S SCALE.												
	0·5	1	2	3	4	5	6	7	8	9	10	11	12
Pressure on the square foot in pounds avoir du poids.	0·11	0·44	1·00	2·25	4·00	6·25	9·00	12·25	16·00	20·25	25·00	30·25	36·00
Velocity in miles.	3·3	6·6	10·0	17·5	25·0	32·5	40·0	47·5	55·0	62·5	70·0	77·5	85·0

The notations of the anemometer during very light airs are not reliable, both with regard to direction and force, for in such instances, when scarcely a draft of wind could be perceived, the cups would be at rest and the direction uncertain, notwithstanding all care having been taken to keep the instrument in perfect working order. The instrument, answering well even in such cases, is yet to be contrived. This applies more especially to inland stations, where the force of wind is so much less than on the coast. At stations along the latter the breeze scarcely ever falls so light as not to be capable of acting on the anemometer, unless it sinks to a dead calm. Such an apparatus is therefore more especially calculated for being erected in prominent positions along the coast. Even so short a distance from the ocean as that from Melbourne to the heads of Port Phillip or Cape Otway admits of noticing this marked difference of „force of wind“ in both localities. This leads to another remark which may well find a place here. At the Flagstaff Observatory, however favorably situated it may have been for observations on currents of air, but a few cases of extreme pressure of wind have been recorded, and when occasionally in puffs the anemometer would indicate a pressure of 27 or 30 $\bar{u}$, this state would last for an instant only, whereas at Cape Otway, there being no instrument at command, the continual oscillations of the mercurial column during gales would frequently afford an opportunity to form an idea of the extreme vehemence and continuity of squalls. Oscillations of the mercury are certainly also observable at Melbourne during northerly and northwesterly gales, they are, however, but slight when compared with those observed on the coast.

It was the invariable rule with the observers to note the force of wind at the time of registration; because a notation of an average value for the preceding hour did not offer sufficient guarantees for uniformity in estimation and the record based thereon; but any change both in direction and „force of wind“ has been carefully observed and remarked in the diary.

2. Frequency of winds. The tables showing the frequency of winds for the single years over which the observations extend have already been published (see R. I. p. 61 and R. II. p. 110); on the figures there given is based the table containing the average number of hours the wind blew from each point of the compass during the years 1858 to 1863.

MONTHS.	S.	Be- tween S. and S. E.	S. E.	Be- tween S. E. and E.	E.	Be- tween E. and N. E.	N. E.	Be- tween N. E. and N.	N.	Be- tween N. and N. W.	N. W.	Be- tween N. W. and W.	W.	Be- tween W. and S. W.	S. W.	Be- tween S. W. and S.	Calms.
	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours	hours
March . . .	85.6	62.2	43.4	30.4	23.0	40.6	55.8	46.2	33.2	32.0	24.2	28.6	39.2	46.6	39.2	85.6	25.2
April . . .	49.2	44.0	30.6	20.4	12.2	25.8	80.0	74.6	53.6	43.4	29.4	37.8	55.0	48.4	30.6	49.2	33.4
May . . .	16.6	17.8	13.6	7.6	8.0	19.0	72.6	124.2	92.2	43.6	57.8	66.2	63.8	48.2	15.4	18.0	28.0
June . . .	21.2	21.6	15.2	8.0	9.4	34.0	99.4	126.2	124.8	67.4	29.4	30.2	38.8	36.2	14.0	19.8	23.2
July . . .	18.8	12.0	19.8	8.8	11.2	17.6	77.8	122.0	122.2	65.8	43.4	42.4	65.2	34.6	16.4	25.2	38.4
August . . .	27.4	17.2	13.8	7.8	6.6	26.2	92.8	106.6	96.2	43.6	35.2	39.6	65.2	56.2	42.2	33.4	32.2
September . .	37.4	23.2	18.8	12.4	9.8	32.2	79.8	84.0	80.4	54.2	51.4	42.0	61.4	51.2	26.8	38.8	12.8
October . . .	66.2	42.8	29.0	15.4	11.6	26.0	55.2	64.6	56.4	51.2	36.2	28.4	49.4	43.8	43.8	104.2	20.8
November . .	71.4	51.8	37.4	30.4	17.8	25.4	42.6	45.2	42.6	26.2	26.0	27.4	49.0	54.6	53.0	103.0	19.4
December . .	92.4	69.4	39.4	33.4	20.8	28.2	39.2	37.6	43.2	34.4	23.4	22.2	43.2	47.8	41.0	99.0	24.2
January . . .	85.8	85.6	41.8	33.2	17.4	25.8	39.4	38.4	41.0	23.4	16.6	27.2	40.8	52.4	43.6	112.0	17.2
February . .	89.8	17.4	50.2	48.2	10.8	19.8	31.0	28.8	30.2	19.8	13.8	18.0	33.2	45.8	47.0	100.6	24.8

Combining these figures for quarters and for the year we obtain values (see the Windrose-table below) which may form the base for determining, according to Bessel's Interpolation formula, a series expressive of the number of hours the wind is likely to blow from a certain point of the compass, the number of hours appearing as a function of the direction of the wind.

It may be called to mind, that the observations have originally been recorded from point to point, and that to simplify calculation and also with a view to attach a greater weight to the single points the original number of 32 was reduced to 16 points (see R. II. 110). All intermediate points, for example between S. and S.E., S. by E., S.S.E. and S.E. by S. were embraced in one group called S.S.E. and so forth. This was at first considered and subsequently proved to be the best plan in this instance, but we shall see when treating on the construction of windroses, that another method is to be applied for diminishing the number of points to which the respective meteorological elements are functions. The values of the meteorological elements, as obtained for any intermediate point, were in the latter case combined with the value for the adjoining cardinal points, adding to each the half of the total number; this was also done with respect to frequency of winds in order to be able to decide about the preference of the one plan to the other; the results speak for themselves; both sets are distinguished by attaching „I” to the set, based on the first described method, and „II” to that according to the second.

In the following series F denotes the frequency of winds, $F^{(m)}$ the same for point m ; the angles are counted from S. to E., N., W. and S. again:

$$\begin{aligned}
 \text{I. Autumn } F^{(m)} &= 130.3 + 31.7 \sin (m 22^\circ 30' + 239^\circ 28') + 45.9 \sin (m 45^\circ 0' + 128^\circ 54') + \dots \\
 \text{Winter } &= 131.8 + 106.4 \sin (m 22^\circ 30' + 262^\circ 23') + 72.6 \sin (m 45^\circ 0' + 130^\circ 45') + \dots \\
 \text{Spring } &= 133.4 + 28.2 \sin (m 22^\circ 30' + 184^\circ 16') + 70.9 \sin (m 45^\circ 0' + 139^\circ 41') + \dots \\
 \text{Summer } &= 127.7 + 69.5 \sin (m 22^\circ 30' + 99^\circ 46') + 56.3 \sin (m 45^\circ 0' + 116^\circ 23') + \dots \\
 \text{Year } &= 523.0 + 93.8 \sin (m 22^\circ 30' + 222^\circ 12') + 232.2 \sin (m 45^\circ 0' + 126^\circ 22') + \dots
 \end{aligned}$$

The discussion of the values according to the second method gave the following equations:

$$\begin{aligned}
 \text{II. Autumn } F^{(m)} &= 135.1 + 36.1 \sin (m 22^\circ 30' + 247^\circ 51') + 48.1 \sin (m 45^\circ 0' + 126^\circ 22') + \dots \\
 \text{Winter } &= 134.3 + 108.0 \sin (m 22^\circ 30' + 261^\circ 13') + 67.8 \sin (m 45^\circ 0' + 124^\circ 22') + \dots \\
 \text{Spring } &= 136.8 + 28.6 \sin (m 22^\circ 30' + 186^\circ 1') + 59.3 \sin (m 45^\circ 0' + 125^\circ 49') + \dots \\
 \text{Summer } &= 131.2 + 75.6 \sin (m 22^\circ 30' + 96^\circ 23') + 58.4 \sin (m 45^\circ 0' + 108^\circ 52') + \dots \\
 \text{Year } &= 537.4 + 95.5 \sin (m 22^\circ 30' + 225^\circ 23') + 235.8 \sin (m 45^\circ 0' + 122^\circ 51') + \dots
 \end{aligned}$$

By the formulae under I. the frequency of winds was calculated for every quarter and the year; the subjoined table shews the results of it, placed in juxta-position with the corresponding observed quantities and the differences between both. In computing the values referred to, only the first two terms have been taken into consideration which, though generally sufficient, seems to impair to a certain extent the accuracy of the results in the present instance.

WINDROSE FOR FREQUENCY OF WINDS.

Direction of Wind	Derived from observations during the years 1858—63.														
	AUTUMN			WINTER			SPRING			SUMMER			YEAR		
	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed
S.	138.7	151.4	-12.7	81.3	67.4	+13.9	177.2	175.0	+ 2.2	246.6	268.0	-21.4	647.0	661.8	- 14.8
S.S.E.	103.9	124.0	-20.1	34.3	50.8	-16.5	114.9	117.8	- 2.9	204.5	172.4	+32.1	473.1	465.0	+ 8.1
S.E.	77.1	87.6	-10.5	-0.2*	48.8	-49.0	57.9	85.2	-27.3	142.8	131.4	+11.4	291.6	353.0	- 61.4
E.S.E.	59.4	58.4	+ 1.0	6.3	24.6	-18.6	35.9	58.2	-22.3	89.7	114.8	-25.1	205.1	256.0	- 50.9
E.	78.5	43.2	+35.3	62.7	27.2	+35.5	59.4	39.2	+20.2	65.5	49.0	+16.5	266.5	158.6	+107.9
E.N.E.	77.2	85.4	- 8.2	153.7	77.8	+75.9	117.0	83.6	+33.4	72.6	73.8	- 1.2	448.0	320.6	+127.4
N.E.	167.0	208.4	-41.4	243.8	270.0	-26.2	169.1	177.6	- 8.5	95.9	109.6	-13.7	656.1	765.6	-109.5
N.N.E.	195.0	245.0	-50.0	296.3	354.8	-58.5	195.3	193.8	+ 1.5	113.2	104.8	+ 8.4	784.2	898.4	-114.2
N.	193.3	179.0	+14.3	292.3	343.2	-50.9	181.4	179.4	+ 2.0	109.6	114.4	- 4.8	773.0	816.0	- 43.0
NN.W.	166.6	119.0	+47.6	240.1	176.8	+63.3	140.3	131.6	+ 8.7	86.9	77.6	+ 9.3	642.7	505.0	+137.7
N.W.	125.9	111.4	+14.5	169.0	108.0	+61.0	100.7	113.6	-12.9	62.6	53.8	+ 8.8	479.0	386.8	+ 92.2
WN.W.	110.0	132.6	-22.6	112.8	112.2	+ 0.6	89.5	97.8	- 8.3	59.1	67.4	- 8.3	381.7	410.0	- 28.3
W.	110.7	158.0	-47.3	90.9	169.2	-78.3	115.6	159.8	-44.2	89.1	117.2	-28.1	405.5	604.2	-298.7
W.S.W.	86.0	143.2	-57.2	99.1	127.0	-27.9	164.4	149.6	+14.8	146.8	146.0	+ 0.8	528.2	565.8	- 37.6
S.W.	151.2	85.2	+66.0	114.6	72.6	+42.0	205.9	123.6	+82.3	209.5	131.6	+77.9	665.3	413.0	+252.3
S.S.W.	156.4	152.8	+ 3.6	112.1	78.4	+33.7	212.9	246.0	-33.1	248.8	311.6	-62.8	721.0	788.8	- 67.8
u=		130.3			131.8			133.4			127.7			523.0	

* The irregularities in the calculated values, particularly in this instance, are to a great measure due to the omission of the third term of the series.

The same table has been derived from the values as under II., but we refrain from adding it here, suffice it to give for both cases the mean error (the mean difference between the observed and the calculated values) for the several quarters and for the year.

Autumn Winter Spring Summer Year.

I . . . 28.27 . . . 40.74 . . . 20.69 . . . 20.61 . . . 90.74.

II . . . 42.32 . . . 50.44 . . . 37.20 . . . 31.05 . . . 158.64.

This sufficiently illustrates the greater reliability of the method I., which we readily anticipated from the fact that the cardinal points are sure to have the preference, whenever an uncertainty exists, and therefore do not require to be still further increased.

The elaborate task of determining the roots of the equation:

$$\frac{d F(m)}{d m} u' \cos (m 22^{\circ}30' + v') + 2u'' \cos (m 45^{\circ}0' + v''),$$

carried out for both sets with a view to ascertain the extremes in direction and value, resulted thus:

		AUTUMN		WINTER		SPRING		SUMMER		YEAR	
		I	II	I	II	I	II	I	II	I	II
Maxima	position	167°23'	167°55'	167°5'	170°11'	330°0'	355°27'	347°42'	351°19'	166°54'	168°19'
	value	198.0	211.9	301.7	302.2	215.5	203.6	253.3	265.1	797.2	823.0
Minima	position	64°55'	64°34'	65°15'	55°13'	66°59'	73°21'	239°8'	242°5'	69°40'	71°0'
	value	59.1	62.0	-3.6*	4.4	35.9	77.5	56.6	56.7	204.4	217.0

* This result is due to the omission of the third term.

3. Mean direction of wind. In computing mean direction and resultant the same principles, already delineated when speaking of the determination of these quantities for each day (R. I. pag. 3 and R. II. pag. 4,113), were adhered to, with but this difference that in all cases, where various mean directions and resultants had to be combined, the formulae:

$$\text{Tang. } \varphi. = \frac{\sum (P. \sin a)}{\sum (P. \cos a)} = \frac{P_0}{Q_0} \text{ and } R = \sqrt{P_0^2 + Q_0^2} \text{ were invariably employed. The factors (P.) represent the sums of the several values of the force for any particular direction of the wind.}$$

After having had computed the hourly variation in mean direction and resultant throughout the day for every month of each of the five years, constituting the period of observation, the respective values were combined in order to get the mean directions and resultants for every month (60 in number), which again were employed for the purpose of calculating these values for »Normal-months« and a normal year. In order to check the results thus obtained, the several years were further divided into quarters, and the same process was gone through. For further illustration of this procedure may be referred to Appendix „4“ and the table for quarterly diurnal variation.

The change in mean direction of the wind throughout the year may be learnt from the subjoined results, in perusing which it must be borne in mind that the angular values are understood to be counted from S. to E., N., W. and back to S. again.

MONTHS.	1858—59.		1859—60.		1860—61.		1861—62.		1862—63.		1858—63.	
	M.direc- tion.	resul- tant.	M.direc- tion.	resul- tant.	M.direc- tion.	resul- tant.	M.direc- tion.	resul- tant.	M.direc- tion.	resul- tant.	M.direc- tion.	resul- tant.
March	18 40	274.4	338 3	548.7	318 29	166.1	327 31	219.8	299 50	312.3	333 28	275.9
April	305 49	216.6	230 3	378.6	196 51	434.5	169 53	209.8	281 46	394.8	235 2	229.8
May	171 19	598.9	208 1	1306.5	211 57	934.1	200 14	790.1	179 3	929.7	195 7	871.9
June	167 25	869.5	202 57	529.7	164 16	720.3	174 59	1411.6	155 19	404.3	172 57	766.5
July	198 4	1016.2	203 27	897.0	153 39	486.7	206 25	626.5	191 24	1590.6	193 34	894.8
August	202 23	806.6	193 1	1081.3	204 44	112.1	202 12	365.0	224 56	620.0	203 40	584.9
September	234 5	990.2	257 17	45.3	180 8	646.4	195 59	541.9	218 49	842.2	212 16	571.1
October	316 6	30.31	225 34	523.8	300 53	336.0	218 57	594.3	306 58	350.2	261 28	308.2
November	332 44	314.6	308 57	644.2	331 14	370.1	310 46	442.4	273 55	427.2	309 57	413.3
December	317 46	481.3	330 5	276.9	313 38	336.5	265 29	379.1	337 1	648.7	316 15	386.5
January	326 19	368.9	316 43	340.5	336 40	541.1	340 53	500.4	335 22	650.2	332 45	475.0
February	309 51	318.1	1 12	730.0	349 6	386.3	0 13	593.4	332 42	801.3	345 42	540.4

The resultants for the whole period of observation, inserted in the last column, were got by dividing the values resulting from the computation by 5, it being irrelevant to know the total values, whereas the procedure pointed out, causes the given quantities to be comparable with those of the several years. It may be mentioned here that the same might have been done with the resultants for the Normal months in appendix Nro. 4; but it being in that case less important to compare the respective values with those for the several years, it may suffice merely to call attention to the difference, and leave the figures as they originally stood.

When comparing the values for 1858, as they are in the above table and in „Result I.“ page 62, we shall find considerable differences; to explain this, it is merely necessary to call to mind that the computation on the first occasion was carried out by the frequency of the wind alone, while now the force has been taken into consideration.

The same applies to the results for 1858 as given in the quarterly table below.

	I QUARTER		II QUARTER		III QUARTER		VI QUARTER	
	M. direct	Result	M. direct	Result	M. direct	Result	M. direct	Result
1858	179 16	205.3	189 36	2596.9	265 54	1159.2	318 19	1161.2
1859	231 18	1420.1	198 51	2498.2	271 46	919.7	343 41	1268.7
1860	213 58	1307.2	163 30	1284.0	252 17	491.3	334 24	1228.8
1861	204 56	840.9	187 16	2529.6	231 1	1103.7	332 30	1168.3
1862	222 47	945.3	193 51	2439.9	251 21	1302.2	334 52	2099.1
1858—62	216 34	904.7	189 12	769.4	254 10	963.6	333 14	1372.7

The resultants for the Normal quarters, as resulting from the computation, were divided by 5 to get the above values for reasons already explained, this being a simular case as that with respect to the resultants for the normal months.

From the above table the mean directions and resultants for the several years of observation result thus:

$18^{58}/_{59} \dots 229^{\circ}58' \dots 3081.0$; $18^{59}/_{60} \dots 237^{\circ}51' \dots 3769.2$; $18^{60}/_{61} \dots 225^{\circ}11' \dots 1924.1$;
 $18^{61}/_{62} \dots 216^{\circ}53' \dots 3407.4$; $18^{62}/_{63} \dots 243^{\circ}54' \dots 3579.4$.

In strict conformity with the practice, adopted through the whole of this volume, the year is reckoned from the beginning of March to the end of February.

We perceive by this series that the mean direction of the wind is subjected to considerable oscillations, the same amounting to 27° within the period of five years over which the observations extend. The general mean direction and resultant we find to be:

S. $231^{\circ}36'$ E. . . . 15533.5 (or 3106.7, if reduced to one year only).

It will be necessary to refer to the oscillations just spoken of, when examining the influence of the mean direction of the wind on the various meteorological elements; we may therefore for the present be allowed to refrain from entering further upon a subject, so highly important for a clear definition of the meteorological features of a climate.

The results obtained by determining mean direction and resultant for every day, lead to another highly interesting discussion. It seems replete with interest to examine the various factors, constituting the knowledge on wind somewhat closer i. e. in shorter periods, and the system of five day means offers an excellent opportunity. The requisite quantities were now determined for each of the 73 penthemeral periods, 25 single daily determinations forming the components. It being no practice to compute the resultants for each day separately, there remained no other choice in executing this task, but to neglect taking the force any further into consideration, as had already been done in deriving the daily mean direction. Nevertheless a resultant was computed, which of course can only possess a relative value, affording merely a criterion as to the directions of the single componing forces. The results of this discussion are to be found in the table „Penthemeral Meteorological outlines“ Appendix Nro. 3.

To illustrate the character of the single components still more, figures are placed alongside of the mean direction, expressive of the number of days on which the daily mean direction fell within either of the four quadrants. Leaving the full discussion of the interesting results just alluded to, to the skill of those more particularly interested in this branches of meteorology, it may suffice for the present, to point out some striking facts of the greatest importance, for forming a correct idea on the meteorology of the S.E. portion of the Australian continent.

Glancing over the mean directions for the 73 penthemeral periods we perceive at once that this long series may be divided in two large groups, the one embracing all periods between the 20th of April and the 14th of September and the other all those between the 18th of October and the 5th of April. For the first named group the mean direction of wind and „(relative-) resultant“ is S $189^{\circ}4'$ E... 66.51 for the other S $344^{\circ}27'$ E.... 69.05; they are separated from each other by two subordinate, intermediate groups, which may be named „critical periods“. These critical periods are: from the 8th to the 17th of October and the 6th to the 20th of April and their respective mean directions and resultants: S $264^{\circ}15'$ E.... 3.55 and S $272^{\circ}16'$ E.... 3.72. In spring, the critical period is not so well defined, as between the 15th of September and the 7th of October, the values are very undecided, showing great oscillations which a longer period of observation would most probably remove, causing thereby the critical period in spring to be equally precise as that in autumn. The mean direction and resultant for the period*) between the 15th of September and the 17th of October are S $240^{\circ}19'$ E and 11.16. What attaches to this division of the year into two groups a particular interest is, that the times of change nearly coincide with the shifting of the monsoons, giving us thus a hint as to the meteorological geographical position of that portion of the Australian continent. We refrain for the present from dwelling any more on this subject, as there will be ample opportunity further to refer to it when treating on the various meteorological elements, this division of the year making itself manifest in many other ways yet. So much may yet be added that the values for the two groups, when combined, result in a mean direction and (relative-) resultant of S $271^{\circ}40'$ E.... 29.00, whereas the difference in direction of the two prevailing currents of air amounts to $155^{\circ}23'$.

4. Another elaborate task was executed, with a view to determine the hourly variation in mean direction and resultant of wind; appendix Nro. 4 shews a detailed account of the result, while a quarterly summary was embodied in this paragraph.

* During this time the mean direction is varying greatly, so much so that it was not thought advisable to include it in the critical period of spring.

QUARTERLY DIURNAL VARIATION OF MEAN DIRECTION AND RESULTANT OF WIND.

Sense: S. E. N. W. S.

QUARTER.	HOUR.	1858.				1859.				1860.				1861.				1862.			
		A.		M.		P.		M.		A.		M.		P.		M.		A.		M.	
		Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.
MARCH, APRIL, MAY.	mid. noon.	191 19	23.5	271 9	26.2	190 32	61.2	250 35	30.5	210 31	43.5	235 46	72.3	193 12	48.6	246 10	61.9	199 17	42.7	220 57	56.1
	1h.	158 35	91.3	288 33	25.1	203 18	72.1	249 41	103.1	175 29	67.2	249 27	67.0	193 29	55.7	241 11	50.0	200 13	36.4	229 43	80.0
	2h.	157 21	191.8	228 0	48.3	202 22	53.1	261 51	104.5	195 14	64.7	267 58	64.6	182 58	54.2	291 36	37.2	193 34	50.7	259 36	56.5
	3h.	158 3	153.0	331 28	76.8	201 26	71.4	287 56	93.3	185 31	84.3	253 22	65.3	177 11	61.1	311 15	42.2	191 52	49.1	286 57	63.4
	4h.	162 26	52.4	345 31	69.3	196 4	71.2	295 10	106.1	192 25	81.8	274 50	58.2	173 54	98.7	308 43	59.5	195 36	44.2	305 18	68.0
	5h.	159 12	56.6	359 32	76.1	179 27	82.4	298 0	85.6	186 58	85.6	270 42	40.8	172 29	75.7	312 42	42.2	201 33	69.7	319 59	53.8
	6h.	168 59	56.8	7 36	74.7	186 28	77.3	289 20	48.3	185 3	78.5	270 0	23.5	168 20	75.7	330 53	37.2	184 34	56.6	329 14	44.6
	7h.	172 17	70.8	19 32	36.6	193 22	72.3	279 39	30.4	184 30	70.0	233 22	18.9	281 19	69.8	329 53	15.1	194 58	60.8	305 35	16.0
	8h.	173 46	71.1	36 8	33.0	197 40	77.8	245 55	40.4	191 23	69.9	206 54	31.0	173 30	84.7	2 35	42.0	191 45	70.7	205 35	10.4
	9h.	193 43	46.1	33 22	25.3	209 43	93.4	231 47	34.7	209 10	72.0	181 18	26.6	192 31	68.7	184 12	13.6	196 19	81.2	251 47	17.3
	10h.	199 19	48.6	70 54	15.0	226 5	119.3	213 17	45.6	217 38	77.3	190 39	51.4	198 21	47.9	203 50	17.8	208 11	88.9	211 2	27.0
	11h.	211 58	40.6	102 10	13.8	232 42	115.2	202 30	44.7	229 18	83.1	207 11	57.6	202 39	53.0	193 34	35.0	217 25	78.2	207 11	24.7
JUNE, JULY, AUGUST.	mid. noon.	196 29	122.2	219 48	120.5	198 13	105.6	215 22	116.1	161 54	53.4	185 23	51.2	177 41	93.8	196 52	103.8	198 10	97.0	215 26	123.0
	1h.	194 33	127.8	230 57	123.8	191 19	102.0	224 39	105.4	161 29	62.0	188 39	50.6	175 31	105.7	193 17	97.5	192 58	119.1	210 55	114.9
	2h.	194 42	139.9	224 6	112.3	196 45	132.9	220 41	96.0	152 10	62.5	200 0	38.4	174 44	110.0	197 53	91.2	192 45	115.2	208 40	102.7
	3h.	195 14	144.8	224 26	95.8	190 51	118.9	212 46	79.4	157 43	69.4	197 26	36.4	180 18	113.2	215 59	77.1	194 48	106.5	213 48	82.1
	4h.	192 2	130.5	228 12	81.8	190 3	114.7	199 49	73.1	164 27	63.0	170 15	35.4	174 24	109.5	198 22	86.6	194 55	111.8	221 46	96.6
	5h.	193 25	147.4	218 41	62.5	180 48	107.2	218 14	66.1	160 55	72.5	169 58	34.4	173 11	119.6	184 4	71.8	194 44	97.2	202 27	85.3
	6h.	193 25	104.9	204 42	65.0	187 0	107.5	201 59	73.2	157 30	71.9	159 35	53.0	173 25	113.4	188 14	62.1	196 40	98.1	193 17	92.2
	7h.	191 1	108.4	200 0	86.2	196 8	105.5	200 21	78.5	156 52	63.4	162 56	49.1	174 7	99.6	185 11	74.2	195 31	92.8	192 25	106.6
	8h.	174 4	115.6	196 19	93.9	194 40	103.5	198 40	83.4	154 19	82.1	147 53	62.5	176 11	103.7	183 59	96.4	194 11	101.6	187 28	123.6
	9h.	193 27	112.3	185 14	118.8	199 4	111.1	186 19	101.9	154 9	63.8	149 56	56.3	182 24	104.7	181 35	94.3	203 18	105.7	189 59	123.9
	10h.	204 47	126.1	187 25	151.3	205 7	119.9	190 16	108.9	166 3	62.2	153 1	73.2	189 16	112.5	180 39	105.3	203 45	114.8	189 42	120.7
	11h.	209 15	111.2	189 4	128.4	209 11	123.2	185 45	112.7	176 32	66.0	96 9	68.7	188 51	116.1	176 30	90.2	218 5	129.7	193 5	113.9
SEPTEMBER, OCTOBER, NOVEMBER.	mid. noon.	243 38	61.4	238 0	76.9	243 44	37.2	277 7	67.5	210 30	33.0	263 26	50.5	216 18	43.3	232 46	91.1	212 54	24.6	247 14	122.8
	1h.	241 17	71.6	275 17	70.1	228 28	29.6	275 58	65.6	194 10	41.9	293 11	52.3	215 42	50.6	246 17	86.2	236 33	26.6	266 29	117.3
	2h.	228 39	69.4	255 1	71.6	235 51	24.8	283 36	80.4	200 26	49.5	291 8	89.5	202 55	49.2	268 7	76.6	223 45	42.0	256 54	127.5
	3h.	234 53	52.3	304 52	63.5	213 12	53.3	303 32	83.1	209 19	54.1	319 29	60.2	194 22	54.8	296 30	51.0	223 21	33.2	277 52	102.4
	4h.	236 6	115.4	306 0	52.7	238 9	8.9	321 9	99.4	248 27	16.5	331 9	83.0	200 15	63.3	241 8	14.3	196 12	55.7	287 0	87.2
	5h.	210 1	81.4	315 20	59.9	356 33	36.9	329 1	90.7	179 17	55.9	349 47	74.7	205 54	49.7	239 18	8.3	206 51	38.1	285 16	63.2
	6h.	214 29	85.2	345 1	92.2	198 53	36.6	329 24	81.7	179 37	44.2	353 26	69.1	193 36	60.0	248 46	13.4	198 16	53.0	206 3	59.3
	7h.	204 39	68.5	336 13	76.8	211 49	44.6	328 43	49.1	188 54	44.0	354 44	37.7	204 38	73.2	224 47	5.9	205 9	64.3	296 12	29.0
	8h.	211 49	104.2	344 38	49.3	232 8	50.2	335 18	46.7	167 19	49.3	1 18	23.3	202 43	81.1	217 12	16.8	208 3	84.5	203 53	34.8
	9h.	236 42	88.9	255 26	29.8	242 44	70.7	329 49	28.4	194 31	37.4	355 18	6.2	214 43	74.9	166 34	29.5	216 0	73.5	206 53	34.5
	10h.	240 48	78.2	232 40	47.3	237 24	64.6	288 51	28.8	222 54	48.5	279 40	19.2	224 31	92.8	201 37	48.7	230 16	89.3	202 59	31.7
	11h.	234 35	57.9	233 17	54.7	254 46	77.1	287 1	34.6	228 56	56.4	258 31	5.2	225 24	80.0	219 51	41.6	239 20	101.1	275 35	16.5
DECEMBER, JANUARY, FEBRUARY.	mid. noon.	298 42	55.4	280 53	55.6	349 22	45.0	309 25	71.2	312 37	35.7	326 57	72.1	353 28	23.8	308 23	68.8	338 10	60.8	324 42	114.6
	1h.	274 25	37.7	313 29	85.9	333 53	33.9	318 5	86.8	312 54	30.9	326 18	99.3	347 4	15.2	290 59	76.8	333 44	58.5	328 43	139.6
	2h.	260 28	24.7	329 45	96.1	349 46	20.8	330 16	105.8	317 24	25.4	334 9	133.7	302 33	5.6	323 48	84.1	318 24	47.7	331 45	148.5
	3h.	230 27	34.2	339 23	86.3	297 52	25.5	342 22	136.0	278 17	11.1	337 42	134.9	314 7	7.5	344 44	127.3	323 51	41.4	338 13	166.5
	4h.	236 11	37.2	346 20	124.4	277 54	72.7	347 51	146.4	304 58	13.8	344 54	187.7	222 43	1.8	343 24	127.8	317 8	37.9	345 43	182.4
	5h.	210 22	48.4	349 11	158.7	266 34	83.1	359 34	130.5	317 30	10.9	355 22	155.8	183 39	15.7	339 41	143.7	293 13	40.6	351 29	169.0
	6h.	245 10	37.1	348 17	167.9	124 10	10.2	356 26	156.2	281 40	9.4	355 47	145.6	185 48	17.8	345 40	136.9	306 50	26.4	352 47	157.6
	7h.	225 50	53.5	350 48	125.8	74 36	7.2	359 24	123.6	301 41	19.0	0 27	113.9	218 40	17.9	359 57	115.7	277 54	18.2	353 33	130.0
	8h.	241 34	46.6	3 44	93.8	347 28	12.9	4 18	122.8	245 33	20.5	357 49	94.5	241 48	23.5	0 49	90.9	248 30	31.9	354 19	119.2
	9h.	231 19	57.1	3 38	72.8	264 13	29.8	7 38	100.2	224 25	27.3	352 30	63.5	244 43	56.0	2 28	74.2	233 39	56.9	346 44	110.7
	10h.	241 33	46.2	13 8	59.9	273 8	47.6	356 32	76.1	258 51	26.9	350 11	56.3	264 38	40.6	346 9	58.1	246 26	72.8	348 23	81.5
	11h.	259 45	36.0	325 13	35.1	294 29	51.9	345 10	66.4	301 48	51.4	345 0	54.5	292 44	49.4	326 43	50.5	230 37	103.9	344 15	70.0

In perusing this table it must be borne in mind, with regard to the last quarter, that the month of December alone refers to the year indicated by the head of the column, January and February on the other hand appertaining to the subsequent year. The observations of the year 1859 were treated in the same way some time ago already, the results which will be found R. II. page 113, tally as well as can be expected, considering that they refer to other periods, a different division of the year having been adopted on the previous occasion.

To avoid repetition we refrain from adding here the hourly variation of the mean direction and resultant for every single month, as resulting from five years observation; the tables in appendix Nr. 4 contain (as already stated) in their last columns the values referred to.

The hourly variation of the mean direction of wind, together with the corresponding resultants, was computed for the whole period of five years; the results may find a place here.

HOURL.	midn.	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
M. direct.	202°3'	202°27'	199°22'	195°58'	193°9'	190°50'	192°5'	193°38'	196°3'	208°39'	219°52'	230°27'
result.	752.4	888.8	980.6	1516.2	1168.0	1199.3	1117.5	1121.5	1241.4	1242.0	1350.9	1299.2
HOURL.	noon	1h.	2h.	3h.	4h.	5h.	6h.	7h.	8h.	9h.	10h.	11h.
M. direct.	248°5'	262°33'	278°38'	301°8'	313°22'	318°6'	334°56'	328°36'	334°1'	242°8'	207°15'	208°24'
result.	1237.5	1259.5	1189.5	1197.3	1174.2	878.4	958.3	540.9	267.4	149.2	498.7	535.6

On examining this series we perceive forthwith the predominating influence of the sun on the motion of the weathervane.

5. Force of wind. This subject may be dealt with in three sections: *a.* Annual march, *b.* Diurnal fluctuation and *c.* Windrose of force of wind.

a. The accompanying table represents the average force for each day throughout the year derived from five years observation, further the means for the single months, quarters and for the year.

The monthly means formed the base for determining the factors of the Interpolation series, representing the annual march of this meteorological element:

$$P^{(n)} = 2.024 + 0.157 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 129^\circ 57' \right\} + 0.093 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 42^\circ 13' \right\} \\ + 0.119 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 315^\circ 48' \right\} + \dots$$

This formula gives the force of wind for any month starting with the first of January; the several values have thus been computed, compared with those received by actual observations and are inserted at the foot of the table.

The further investigations into the nature of the above series, with a view to determine the time of Maximum and Minimum during the year, do not yield satisfactory results, at least as far as the Maximum is concerned, the same being not distinctly enough marked. Only so much is evident that the force of wind reaches its highest mean value during the month of January, which however is nearly equalled by the values for June, September, October and December. The result of this investigation is more satisfactory with regard to the Minimum value the occurrence of which is indicated by the formula to take place on the 1.3 day of April.

ANNUAL MARCH OF FORCE OF WIND.

(Mean for the year: 2.024.)

1858—63.		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	Septbr.	October.	Novbr.	Decemb.	January.	Febr.
		(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)
1 st		2.08	1.40	2.37	1.44	2.38	1.35	1.90	2.59	1.99	1.63	2.22	2.32
2 ^d		1.42	2.14	1.70	1.37	2.43	2.20	2.18	2.86	2.49	2.44	2.42	2.16
3 ^d		1.50	2.20	2.50	1.07	1.97	1.13	2.35	1.87	2.33	2.75	2.43	1.74
4 th		1.70	1.54	2.45	1.05	2.76	1.16	1.51	1.71	1.54	3.05	2.34	1.80
5 th		1.68	2.68	1.88	1.03	2.29	1.41	1.41	1.79	2.27	1.51	2.38	2.02
6 th		1.76	2.08	2.05	1.35	2.10	1.67	1.97	2.07	2.28	2.19	1.64	2.44
7 th		1.46	2.08	2.07	2.15	2.53	1.37	2.74	2.26	2.96	2.18	1.60	1.44
8 th		1.64	1.80	1.21	2.10	2.60	1.47	2.58	2.88	1.88	2.22	1.58	1.66
9 th		1.88	1.36	1.83	2.40	3.09	2.28	2.57	1.68	2.30	1.34	2.19	2.92
10 th		1.70	1.62	1.55	2.19	2.33	2.19	1.72	1.38	1.28	1.64	3.14	1.72
11 th		1.88	2.14	1.75	2.15	2.10	2.17	1.75	1.51	3.09	2.18	3.18	2.22
12 th		2.04	2.38	2.54	2.11	2.14	2.58	1.92	2.17	2.17	1.86	2.71	2.26
13 th		1.56	2.04	3.13	2.11	1.89	2.24	2.35	1.59	2.19	2.28	2.29	1.28
14 th		2.10	1.64	2.41	1.58	2.29	2.36	2.83	2.10	2.53	2.01	2.71	1.30
15 th		1.90	2.44	2.14	0.87	2.37	2.29	2.92	2.30	1.74	2.61	2.31	1.78
16 th		2.08	1.82	2.13	1.27	2.12	2.10	2.43	2.62	1.68	2.92	1.84	1.76
17 th		1.86	2.22	2.22	1.50	1.67	0.90	2.21	1.82	2.38	2.39	1.72	1.58
18 th		1.70	2.32	1.90	1.67	1.29	1.84	2.71	2.11	1.14	2.00	1.93	2.14
19 th		0.90	1.72	2.28	2.02	1.26	2.16	2.74	2.11	1.58	2.48	2.52	2.94
20 th		1.28	1.54	1.99	1.80	1.40	2.41	2.10	2.68	1.83	2.51	2.00	1.76
21 st		1.46	1.20	2.46	2.09	2.35	3.32	2.48	1.52	1.79	2.11	2.18	1.88
22 ^d		1.58	1.52	2.30	2.26	2.65	2.19	2.44	1.98	2.45	1.49	2.97	0.94
23 ^d		1.22	1.62	2.26	1.82	2.37	2.29	1.94	2.18	2.90	1.80	3.17	2.30
24 th		1.66	1.16	2.22	2.25	2.30	3.05	2.11	2.90	2.19	2.25	1.60	2.62
25 th		2.00	0.92	2.23	2.20	2.08	1.25	1.88	2.03	3.04	1.42	2.32	1.78
26 th		1.64	1.02	1.80	1.94	2.14	2.25	1.67	1.70	2.22	1.94	2.92	1.98
27 th		1.14	1.56	1.84	2.36	2.42	2.20	2.35	1.33	1.91	2.28	1.97	2.48
28 th		1.56	1.50	1.67	2.16	2.12	1.90	1.85	2.36	2.11	2.23	1.82	1.38
29 th		1.08	1.64	2.29	1.94	1.24	2.05	2.29	2.27	2.10	1.64	2.08	
30 th		1.62	2.56	2.52	3.00	1.26	2.13	2.05	2.41	1.65	1.89	2.25	
31 st		1.80		2.34		1.68	1.88		1.89		2.24	2.14	
MEANS	observed	1.64	1.79	2.13	1.84	2.12	1.99	2.20	2.09	2.13	2.11	2.28	1.95
	calculated	1.69	1.80	2.02	2.20	1.96	2.07	2.18	2.11	2.06	2.20	2.23	1.94
	calc. — observ.	+0.05	+0.01	-0.11	+0.18	-0.16	+0.08	-0.02	+0.02	-0.06	+0.09	-0.05	-0.01
MEANS FOR THE QUARTERS.		1.856			1.985			2.139			2.118		

b. The entire want of a reliable instrument for measuring the ascending current of air, playing such an important part with respect to the changes in nearly every one of the other meteorological elements, makes it almost compulsory to attach particular weight to the hourly change in force of wind. A knowledge of it remedies to a certain extent the deficiency just pointed out, and from this point of view great attention and care was bestowed on the construction of hourly variation tables for each separate year of observation, which will be found in R. I. page 58 and appendix Nro. 6 and 7. From these various tables average values have been derived, which are contained in this table:

DIURNAL FLUCTUATION OF FORCE OF WIND.

HOUR	During the years 1858 to 1863.												
	March.	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year
	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)
Midnight	1.21	1.52	1.75	1.76	2.01	1.93	1.91	1.51	1.49	1.53	1.63	1.55	1.650
1 ^h . AM	1.12	1.45	1.92	1.73	2.01	1.85	1.94	1.55	1.47	1.30	1.71	1.42	1.623
2	1.09	1.46	1.94	1.83	1.99	1.91	1.82	1.70	1.52	1.35	1.73	1.40	1.645
3	1.24	1.62	2.05	1.78	2.00	2.00	1.86	1.75	1.51	1.41	1.74	1.42	1.698
4	1.39	1.64	2.04	1.76	2.14	1.99	2.00	1.70	1.45	1.38	1.68	1.37	1.712
5	1.38	1.64	2.18	1.84	2.03	1.95	2.03	1.74	1.46	1.39	1.63	1.31	1.715
6	1.26	1.58	2.05	1.78	2.05	1.78	1.91	1.67	1.65	1.50	1.56	1.32	1.676
7	1.41	1.58	2.10	1.74	1.85	1.66	1.95	1.97	2.02	1.81	1.78	1.54	1.784
8	1.60	1.75	2.06	1.70	1.90	1.77	2.35	2.25	2.35	2.17	2.05	1.71	1.972
9	1.61	1.89	2.12	1.75	1.83	1.93	2.48	2.23	2.29	2.31	2.18	1.90	2.023
10	1.68	2.07	2.41	1.94	2.03	2.16	2.73	2.43	2.44	2.41	2.32	2.02	2.220
11	1.85	2.22	2.61	2.11	2.24	2.37	2.89	2.51	2.57	2.52	2.49	2.12	2.375
Noon	2.00	2.27	2.66	2.19	2.46	2.58	3.03	2.53	2.78	2.80	2.65	2.41	2.530
1 ^h . PM	2.03	2.28	2.74	2.17	2.47	2.61	2.86	2.63	2.93	2.91	2.82	2.40	2.571
2	2.20	2.24	2.63	2.15	2.32	2.48	2.71	2.77	2.93	2.76	3.01	2.50	2.558
3	2.29	2.28	2.44	2.11	2.35	2.49	2.66	2.70	2.82	2.94	3.16	2.78	2.585
4	2.44	2.21	2.29	1.98	2.13	2.27	2.61	2.50	2.90	2.97	3.29	2.86	2.538
5	2.34	1.91	2.08	1.83	1.87	2.00	2.24	2.25	2.80	2.99	3.29	2.67	2.356
6	2.02	1.82	1.93	1.66	1.83	1.77	2.04	2.01	2.66	2.75	3.04	2.55	2.173
7	1.68	1.63	1.94	1.67	1.84	1.65	1.78	1.81	2.07	2.20	2.50	2.13	1.908
8	1.49	1.61	1.85	1.82	1.86	1.78	1.86	1.76	1.97	2.17	2.42	2.01	1.883
9	1.34	1.51	1.83	1.83	2.04	1.85	1.96	1.66	1.82	2.05	2.13	1.89	1.826
10	1.31	1.52	1.83	1.86	2.11	1.90	1.92	1.63	1.74	1.68	2.00	1.70	1.767
11	1.27	1.52	1.91	1.86	2.07	1.86	2.04	1.53	1.61	1.53	1.75	1.65	1.717

Basing upon the above values we obtain by the aid of Bessel's interpolation formula the following equations for the diurnal variation in force of wind:

$$\begin{aligned}
 \text{for March } P^{(n)} &= 1.635 + 0.5353 \sin (15n + 54^\circ 3') + 0.1670 \sin (30n + 334^\circ 35') \\
 &\quad + 0.0622 \sin (45n + 262^\circ 18') + \dots \\
 \text{,, April } &= 1.801 + 0.3918 \sin (15n + 74^\circ 27') + 0.1311 \sin (30n + 41^\circ 23') \\
 &\quad + 0.0196 \sin (45n + 77^\circ 44') + \dots \\
 \text{,, May } &= 2.140 + 0.3592 \sin (15n + 90^\circ 8') + 0.1718 \sin (30n + 41^\circ 39') \\
 &\quad + 0.0819 \sin (45n + 54^\circ 32') + \dots \\
 \text{,, June } &= 1.869 + 0.1489 \sin (15n + 72^\circ 4') + 0.1360 \sin (30n + 62^\circ 39') \\
 &\quad + 0.0860 \sin (45n + 35^\circ 32') + \dots
 \end{aligned}$$

$$\begin{aligned}
\text{for July} \quad . \quad &= 2.059 + 0.1146 \sin (15n + 79^\circ 6') + 0.1858 \sin (30n + 55^\circ 36') \\
&\quad + 0.1338 \sin (45n + 32^\circ 48') + \dots \\
\text{,, August} \quad . &= 2.023 + 0.2704 \sin (15n + 76^\circ 6') + 0.2702 \sin (30n + 51^\circ 1') \\
&\quad + 0.0938 \sin (45n + 47^\circ 31') + \dots \\
\text{,, September} \quad &= 2.233 + 0.4920 \sin (15n + 84^\circ 51') + 0.2267 \sin (30n + 78^\circ 59') \\
&\quad + 0.0153 \sin (45n + 22^\circ 23') + \dots \\
\text{,, October} \quad . &= 2.033 + 0.5545 \sin (15n + 78^\circ 2') + 0.1289 \sin (30n + 36^\circ 3') \\
&\quad + 0.0300 \sin (45n + 273^\circ 11') + \dots \\
\text{,, November} \quad &= 2.135 + 0.7559 \sin (15n + 61^\circ 21') + 0.0571 \sin (30n + 11^\circ 48') \\
&\quad + 0.0880 \sin (45n + 251^\circ 13') + \dots \\
\text{,, December} \quad . &= 2.118 + 0.8301 \sin (15n + 53^\circ 20') + 0.0336 \sin (30n + 316^\circ 0') \\
&\quad + 0.0731 \sin (45n + 224^\circ 5') + \dots \\
\text{,, January} \quad . &= 2.273 + 0.7764 \sin (15n + 40^\circ 54') + 0.1708 \sin (30n + 334^\circ 34') \\
&\quad + 0.0959 \sin (45n + 212^\circ 35') + \dots \\
\text{,, February} \quad . &= 1.943 + 0.6725 \sin (15n + 40^\circ 35') + 0.0998 \sin (30n + 354^\circ 15') \\
&\quad + 0.0805 \sin (45n + 238^\circ 7') + \dots \\
\text{for the year} \quad . &= 2.022 + 0.4701 \sin (15n + 61^\circ 47') + 0.1216 \sin (30n + 34^\circ 28') \\
&\quad + 0.0099 \sin (45n + 344^\circ 55') + \dots
\end{aligned}$$

According to these formulae the values of the force of wind have been computed for each hour in every month and the year, the difference between the values thus received and those actually observed are, together with their respective algebraic signs, to be learnt by the subjoined table:

TABLE SHEWING THE DIFFERENCE BETWEEN THE OBSERVED AND CALCULATED
VALUES OF THE DIURNAL FLUCTUATION OF FORCE OF WIND
(calculated minus observed values)

Hour	During the years 1858 to 1863												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year.
	(0-1 2)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)
Midnight	-0.02	-0.03	+0.07	+0.04	+0.02	-0.03	+0.04	+0.09	+0.07	-0.05	+0.11	+0.01	+0.030
1 ^h AM	+0.07	+0.06	-0.05	+0.05	0.00	+0.08	+0.01	+0.07	+0.05	+0.21	+0.02	+0.09	-0.046
2	+0.11	+0.09	+0.01	-0.07	+0.02	+0.04	+0.10	-0.07	-0.07	+0.01	-0.01	+0.03	+0.018
3	-0.03	-0.05	-0.02	+0.01	+0.05	-0.04	+0.02	-0.10	-0.09	-0.09	-0.07	-0.07	-0.035
4	-0.14	-0.06	+0.04	+0.04	-0.08	-0.05	-0.11	-0.02	-0.01	-0.04	-0.05	-0.07	-0.041
5	-0.08	-0.05	-0.09	-0.04	+0.03	-0.07	-0.13	+0.01	+0.09	+0.04	-0.01	0.00	-0.019
6	+0.12	+0.02	+0.03	-0.01	-0.05	+0.02	+0.07	+0.16	+0.08	+0.09	+0.11	+0.08	+0.065
7	+0.06	+0.09	-0.04	-0.01	+0.06	+0.10	+0.16	-0.01	-0.07	+0.01	+0.02	0.00	+0.030
8	-0.06	0.00	+0.02	+0.04	-0.04	+0.01	-0.07	-0.15	-0.01	-0.11	-0.08	0.00	-0.053
9	0.00	-0.02	+0.06	+0.05	+0.05	-0.03	+0.02	+0.02	+0.07	-0.02	-0.03	-0.03	+0.030
10	+0.01	-0.04	-0.06	-0.03	0.00	-0.05	-0.04	-0.04	+0.07	+0.06	+0.01	-0.01	-0.012
11	-0.06	-0.04	-0.07	-0.15	-0.03	-0.01	-0.04	0.00	+0.05	+0.08	0.00	+0.03	-0.010
Noon	-0.07	+0.02	+0.02	-0.01	-0.07	-0.02	-0.08	+0.09	-0.08	-0.08	+0.01	-0.11	-0.028
1 PM	+0.03	+0.05	-0.01	+0.07	+0.02	+0.04	+0.07	+0.05	-0.11	-0.10	+0.01	+0.05	+0.024
2	+0.04	+0.07	+0.04	+0.05	+0.13	+0.11	+0.13	-0.08	-0.02	+0.14	+0.01	+0.11	+0.065
3	+0.06	-0.05	+0.07	-0.04	-0.06	-0.07	0.00	-0.09	+0.14	+0.02	+0.01	-0.05	-0.004
4	-0.09	-0.11	+0.01	-0.06	-0.05	-0.09	-0.18	-0.02	0.00	-0.01	-0.04	-0.10	-0.061
5	-0.10	+0.04	+0.03	-0.03	+0.03	-0.04	-0.02	+0.04	-0.05	-0.12	-0.09	+0.02	-0.026
6	0.00	0.00	+0.05	+0.07	-0.01	+0.05	0.00	+0.06	-0.15	-0.06	-0.03	-0.05	-0.008
7	+0.09	+0.06	-0.04	+0.06	-0.01	+0.09	+0.15	+0.05	+0.16	+0.24	+0.22	+0.13	+0.102
8	+0.05	-0.02	+0.01	-0.04	+0.06	-0.02	+0.02	-0.06	-0.15	-0.01	-0.05	0.00	0.000
9	+0.01	+0.02	+0.01	-0.01	-0.02	-0.05	-0.08	-0.05	-0.04	-0.14	-0.04	-0.08	-0.035
10	-0.08	-0.03	0.00	-0.01	-0.04	-0.05	-0.01	-0.06	-0.07	+0.03	-0.13	-0.01	-0.035
11	-0.08	-0.04	-0.09	-0.04	0.00	+0.02	-0.09	+0.04	-0.01	+0.05	+0.02	-0.04	-0.020

Looking over these differences we must certainly arrive at the conclusion that the formulae, employed in computing them, express exceedingly well the actual fluctuations, but we also cannot help being struck by the fact that mere estimation, carefully carried out, is by far more reliable than we are generally disposed to give it credit for. We shall have further occasion yet to refer to this when speaking on the diurnal variation in atmospheric pressure:

$$\text{The equation } \frac{dP(n)}{dn} = 0 = u' \cos(n15^\circ + \nu') + 2u'' \cos(2n15^\circ + \nu'') + 3u''' \cos(3n15^\circ + \nu'''),$$

examined with the object of determining its roots, gives with regard to time and value of the extremes in diurnal fluctuation the following results:

If we neglect the third term in solving the above problem, the value of the results is greatly impaired, it was therefore made an invariable rule, in this as in all subsequent cases of a similar nature, to carry the computation to the third term of the series.

Value and time of the extremes in diurnal Fluctuation of Force of wind.

MONTHS.	Maximum		Minimum		MONTHS.	Maxima		Minima	
	value.	Time.	value.	Time.		value.	Time.	value.	Time.
	(0—12)	h. m.	(0—12)	h. m.		(0—12)	h. m.	(0—12)	h. m.
March	2.36	3 30	1.19	11 46	September	2.96	12 27	1.88	8 21
April	2.33	1 12	1.48	10 55	October	2.69	1 12	1.57	10 20
May	2.73	12 57	1.81	10 58	November	2.95	3 0	1.42	3 13*
June	2.24	1 6	1.72	6 27	December	2.98	3 32	1.32	3 15*
July	2.49	1 12	1.81	6 15	January	3.26	4 8	1.62	4 42*
August	2.65	1 7	1.75	7 18	February	2.76	3 49	1.30	4 20*
Year	2.623	1 54	1.663	2 33	* Only in cases where an asterisk is affixed to the time the extreme occurs in the morning.				

c. Windrose of force of wind. In „Results“ page 64 and appendix Nro. 6 of this volume are to be found tables containing the mean force of wind for each point of the compass during the several years of observation, as also the average values for the whole period. The values of the table below, in which the original number of 32 points is reduced to 16, are the results of an equal distribution of the respective mean force for the intermediate in favour of the adjoining principle points. The values *u* at the foot of the table are simply the means derived from the values for all points in a certain month.

Monthly means of force of Wind for sixteen points of the Compass.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	Aug.	Sept.	Octbr.	Nov.	Dec.	Jan.	Feb.
	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)
S.	1.97	1.80	1.44	1.35	1.12	1.54	1.75	1.85	2.14	2.24	2.44	2.24
S.S.E.	1.58	1.57	1.19	1.11	1.27	1.37	1.38	1.37	1.44	1.61	1.86	1.66
S.E.	1.13	1.74	1.16	1.24	1.50	1.35	1.40	0.32	1.36	1.38	1.54	1.89
E.S.E.	1.12	1.09	1.08	1.09	1.14	1.06	1.47	0.84	1.54	1.17	1.73	1.59
E.	0.99	0.96	0.89	0.83	0.97	1.02	1.09	0.82	1.03	0.95	1.28	1.00
E.N.E.	1.07	1.21	1.18	1.16	1.13	1.32	1.28	1.34	1.23	1.18	1.32	1.18
N.E.	1.44	1.52	1.80	1.52	1.44	1.46	1.80	1.68	1.77	1.58	1.56	1.38
N.N.E.	1.91	2.27	2.89	2.40	2.70	2.18	2.67	2.90	2.53	2.42	2.50	2.15
N.	2.45	2.52	2.83	2.53	3.17	2.66	4.92	5.56	3.09	3.41	3.16	2.62
N.N.W.	1.70	1.97	2.28	2.02	2.17	1.79	2.01	2.29	2.32	2.99	2.84	2.51
N.W.	1.48	1.34	1.87	1.69	1.93	1.66	1.98	2.20	1.85	2.25	1.89	1.35
W.N.W.	1.61	1.91	2.07	1.76	2.22	2.40	2.39	2.17	1.90	2.14	2.19	1.61
W.	2.02	2.24	2.29	1.98	2.55	2.29	2.48	2.57	2.44	2.57	2.78	2.24
W.S.W.	2.13	2.18	2.05	1.98	2.05	2.11	2.57	2.34	2.61	2.67	2.62	2.31
S.W.	2.17	1.79	1.97	1.58	1.84	1.96	2.58	2.18	2.66	2.52	2.60	2.45
S.S.W.	2.25	2.17	0.33	1.37	1.29	1.71	2.13	1.70	0.34	2.61	2.70	2.52
<i>u</i> =	1.688	1.767	1.707	1.600	1.780	1.742	2.118	2.008	1.890	2.105	2.188	1.918

In reducing the values of this table still further to quarterly and yearly results, for the purpose of simplifying computation, a plan was adopted identical to the one fully explained in the „introduction“, when speaking on the construction of windroses.

DIREC- TION OF WIND	DERIVED FROM OBSERVATIONS DURING THE YEARS 1858 to 1863														
	AUTUMN			WINTER			SPRING			SUMMER			YEAR		
	calcu- lated	observed	calculated minus observed	calcu- lated	observed	calculated minus observed	calcu- lated	observed	calculated minus observed	calcu- lated	observed	calculated minus observed	calcu- lated	observed	calculated minus observed
	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)
S.	2.012	1.954	+0.058	2.394	2.310	+0.084	2.033	1.977	+0.056	1.507	1.361	+0.146	2.082	2.013	+0.069
S.S.E.	1.553	1.411	+ .142	1.940	1.714	+ .226	1.629	1.600	+ .029	1.252	1.256	— .004	1.703	1.548	+ .155
S.E.	1.148	1.305	— 1.57	1.453	1.644	— .191	1.221	1.260	— .039	1.041	1.368	— .327	1.316	1.418	— .102
E.S.E.	0.977	1.334	— .357	1.153	1.530	— .377	1.001	1.213	— .212	0.974	1.096	— .122	1.101	1.345	— .244
E.	1.124	0.988	+ .136	1.179	1.063	+ .116	1.077	1.067	+ .010	1.101	0.916	+ .185	1.168	1.015	+ .153
E.N.E.	1.525	1.250	+ .275	1.512	1.219	+ .293	1.409	1.198	+ .211	1.400	1.234	+ .166	1.489	1.223	+ .266
N.E.	2.008	1.743	+ .265	1.989	1.509	+ .480	1.835	1.583	+ .252	1.775	1.497	+ .278	1.919	1.598	+ .321
N.N.E.	2.378	2.702	— .324	2.391	3.366	— .975	2.159	2.442	— .283	2.104	2.442	— .338	2.270	2.515	— .245
N.	2.524	2.983	— .459	2.564	2.129	+ .435	2.257	2.587	— .330	2.293	2.799	— .506	2.412	2.852	— .440
N.N.W.	2.463	2.177	+ .286	2.496	2.825	— 3.29	2.143	1.998	+ .145	2.318	2.019	+ .299	2.341	2.184	+ .157
N.W.	2.316	2.009	+ .307	2.311	1.905	+ .406	1.947	1.565	+ .382	2.227	1.759	+ .468	2.164	1.808	+ .356
W.N.W.	2.227	2.184	+ .043	2.183	2.000	+ .183	1.829	1.855	— .026	2.096	2.145	— .049	2.031	2.060	— .029
W.	2.246	2.488	— .224	2.223	2.548	— .325	1.881	2.166	— .285	1.991	2.296	— .305	2.038	2.368	— .330
W.S.W.	2.383	2.512	— .129	2.412	2.538	— .126	2.067	2.113	— .046	1.922	2.057	— .135	2.167	2.312	— .145
S.W.	2.452	2.483	— .031	2.607	2.527	+ .080	2.245	2.140	+ .105	1.849	1.850	— .001	2.301	2.291	+ .010
S.S.W.	2.342	2.170	+ .172	2.633	2.614	+ .019	2.259	2.227	+ .032	1.718	1.481	+ .237	2.298	2.245	+ .053
u=		1.981			2.090			1.812			1.723			1.925	

The values u are again the arithmetical means of the figures of the column, to which they are attached.

The method of the least squares furnishes us, based upon the above given values, with the equations:

$$\begin{aligned}
 \text{for Autumn } P^{(m)} &= 1.981 + 0.625 \sin (m 22^\circ 30' + 204^\circ 11') + 0.380 \sin (m 45^\circ 0' + 130^\circ 57') \\
 \text{Winter.} &= 2.090 + 0.529 \sin (m 22^\circ 30' + 189^\circ 15') + 0.441 \sin (m 45^\circ 0' + 118^\circ 8') \\
 \text{Spring.} &= 1.812 + 0.417 \sin (m 22^\circ 30' + 195^\circ 34') + 0.404 \sin (m 45^\circ 0' + 124^\circ 24') \\
 \text{Summer} &= 1.723 + 0.594 \sin (m 22^\circ 30' + 221^\circ 27') + 0.198 \sin (m 45^\circ 0' + 116^\circ 42') \\
 \text{Year} &= 1.925 + 0.465 \sin (m 22^\circ 30' + 200^\circ 46') + 0.371 \sin (m 45^\circ 0' + 119^\circ 53')
 \end{aligned}$$

These formulae yield the above calculated values, inserted in the table along with the corresponding observed mean force of wind. The differences go to prove the close coincidence of the formulae and actual observation, the mean error amounting to 0.210 for autumn, 0.290 for winter, 0.153 for spring, 0.223 for summer and 0.192 for the year.

Enquiring into the nature of the series, expressing the dependence of the force of wind on its direction, we find these relations with regard to time and value of the extremes:

	MAXIMUM.		MINIMUM.		POSITIONS OF MEAN.
	value.	position.	value.	position.	
Autumn . . .	2.525	183° 1'	0.977	68° 26'	1° 37' and 133° 41'
Winter . . .	2.652	329 1	1.121	77 4	15 45 „ 139 57
Spring . . .	2.281	327 56	0.991	73 9	12 59 „ 133 41
Summer . . .	2.326	194 53	0.971	64 32	337 3 „ 131 49
Year . . .	2.414	182 38	1.090	73 40	10 3 „ 135 18

6. The law of the turning of the wind. The direct proofs to support Dove's theory on the alternation of the polar- and equatorial current, and the sense in which the change takes place, have been already referred to in the previous publications issued from the Flagstaff Observatory (R. I. page 65, R. II. page 114), nevertheless we subjoin here an analysis of the discussion on the observations made at Melbourne, calculated to assist in establishing the truth of the law of rotation of wind for the southern temperate zone.

The practice at the Observatory, to subject the daily records on the weathervane to a rigorous examination immediately after the observations had been made, allowed to complete this extensive piece of work in a comparatively short space of time. The accumulation of observations of this sort makes it almost impossible to do justice to it after the lapse of some time, as in addition to the disheartening effect such a number of records will produce upon the mind of any one, it is in some cases of an undecided nature absolutely necessary to have a distinct recollection of the state of things at the time of registration; otherwise many valuable facts will escape our attention and cannot therefore be turned to account. This applies more especially to veerings of the wind from one point of the compass to that nearly opposite; but it must be understood that, whenever two consecutive registrations differed from each other by 16 points, the motion of the vane for the intervening hour was noted as a „jump”, except it was expressly described to have been otherwise. The sum of the numbers of points the motion was direct or positive (from S. to E., N., W. and S.) and the sum of the numbers of points the motion was retrograde or negative (from S. to W., N., E. and S.) were subtracted from each other and the remainder, after dividing it by 32, called „a revolution” plus or minus as the case may have been.

MONTHS.	1858—59		1859—60		1860—61		1861—62		1862—63		1863—64		1864—65	
	Direct Revol.	Jumps.	Direct Revol.	Jumps.	Direct Revol.	Jumps.	Direct Revol.	Jumps.	Direct Revol.	Jumps.	Direct Revol.	Jumps.	MEAN NUMBER.	
													Dir. Revol.	Jumps.
March	9.2	4	3.0	2	5.1	6	7.3	7	4.3	7	5.78	5.2		
April	4.2	3	3.8	2	4.6	2	—0.3	4	1.6	3	2.78	2.8		
May	2.1	3	0.4	0	2.2	0	4.1	5	2.9	3	2.34	2.2		
June	2.6	1	1.7	0	4.7	1	1.0	0	1.6	3	2.32	1.0		
July	3.5	1	3.7	3	4.4	2	1.9	6	1.4	0	2.98	2.4		
August	1.8	1	1.6	0	1.9	12	5.2	7	2.1	1	2.52	4.2		
September	6.2	0	1.7	3	10.1	2	5.9	2	2.7	1	5.32	1.6		
October	1.5	4	6.6	2	6.7	1	6.6	6	6.5	8	5.58	4.2		
November	3.3	1	3.7	2	3.7	8	2.3	2	9.2	6	4.44	3.8		
December	6.2	2	4.4	3	1.3	3	7.8	3	8.7	2	5.68	2.6		
January	4.8	2	2.8	2	5.4	6	—1.2	5	3.9	0	3.14	3.0		
February	2.8	8	—0.2	4	2.1	4	1.4	2	2.8	2	1.78	4.0		
Sums for the year	48.2	30	33.2	23	52.2	47	42.0	49	47.7	36	44.66	37.0		
Monthly Means .	4.0	—	2.8	—	4.4	—	3.5	—	3.9	—	3.72	3.08		

Whether or not the excess of direct over retrograde revolutions be subjected to a seven years periodicity is scarcely possible to decide by the above results, the period of observation being too short, but as now by the aid of an anemometer, careful records on the motion of the wind are carried on at the Melbourne Observatory, they may some day become highly valuable even with respect to the solution of the question just indicated.

This subject might be still further illustrated by an examination of the veerings of the mean directions of the wind, we shall have to refrain, however, from entering upon such a task, as it would lead too far from the scope of this work, and as all materials for such a purpose have been reduced and condensed so as to be ready for the use of those more especially interested.

7. Upper Currents of air. Before closing this chapter it seems yet to be incumbent upon us to give the results of our investigations on upper currents of air. In the „Results” I page 100 a complete extract from the journals of the Observatory was printed, illustrative of the manner in which records bearing on this question have been effected. Neither time nor space would admit of completing this task and it was for this reason thought advisable to subject the 4221 single observations on the motion of the upper atmosphere to a discussion, not pretending, however, thereby to exhaust the materials at our command. It is merely the object of the present analysis to shew how far the upper currents coincide in their motion with those at the surface, that there is a deflection noticable and to determine the degree and sense of that deflection throughout various seasons. In order to make the facts thoroughly understood it may be supposed that, when speaking of a deflection, we mean the angle between the direction of the wind and that of the upper current, observed by the aid of the drifting of clouds; in case the latter be to the left of the former, looking towards the point from which the wind blows, we call it plus and should it be to the right minus. It is scarcely necessary to mention that, the direction of the upper current, having been recorded according to the

general custom in the opposite direction to the current at the surface, had to be altered by 16 points. The deflections and corresponding signs have been determined for each single registration, the sums of all the positive and that of all the negative values for every months during the five years of observation were taken, and adopting the number of registrations as components, which were combined with the respective angles of deflection, we obtained, by the aid of the formulae for computing the mean direction of the wind, mean deflections of the upper current with respect to the mean direction of the wind.

PERIOD	NUMBER OF OBSERVATIONS			MEAN DEFLECTION		GENERAL MEAN DEFLECTION	
	positive	Total	negative	+	—		
March	178	348	170	72° 37'	74° 28'	+ 3° 32'	
April	289	403	114	66 26	75 0	+46	55
May	334	419	85	65 30	52 13	+51	9
Autumn	801	1170	369	67 24	69 30	+42	2
June	343	416	73	63 18	66 13	+52	34
July	302	371	69	68 10	87 18	+61	22
August	291	368	77	67 24	65 18	+54	4
Winter	936	1155	219	66 6	72 30	+55	29
September	219	318	99	64 4	64 30	+37	53
October	217	374	157	61 12	66 42	+15	26
November	151	323	172	72 45	76 48	—15	29
Spring	587	1015	428	65 12	70 12	+18	24
December	147	337	190	73 54	81 18	—33	47
January	136	280	144	61 42	66 0	— 5	31
February	123	264	141	71 40	78 19	—17	34
Summer	406	881	475	69 6	75 45	—17	13
Year	2730	4221	1491	66 45	72 9	+35	21

When speaking of the mean direction of the wind, it was pointed out that, with respect to it the year might be divided in two large halves, say from May to September and from November to March, omitting the critical months of April and October.

A computation of the mean deflection for these periods resulted as follows:

	Total Number of Observations.	Positive Deflection.	Negative Deflection.	General mean Deflection.
May to September	1892	65° 42'	66° 17'	+ 51° 54'
November to March	1552	70° 42'	75° 42'	— 12° 25'

The mean direction of the upper current derived from these facts is consequently

from May to September S. 240° 58' E.

from November to March S. 331° 52' E.

So great a number of observations, made at all hours of the day and at all seasons, would certainly allow of being discussed from many other points of view yet, for instance: daily fluctuations in deflections of the Upper Current, rate of rotation with respect to the same at the surface, and many others, but the entering upon such topics would hardly be compatible with the scope of this work. It may therefore suffice for the present to have shown by the above facts, how important it is for the exact understanding of meteorological phenomena to pay more attention to this subject than hitherto has been done.

II. PRESSURE OF AIR.

8. In addition to the information, referring to the manner in which the observations on atmospheric pressure have been made and reduced, and contained in „R. I. pag. 1 and R. II. pag. 3“ some few remarks may find a place here. From the passages in the previous publications just referred to we learn that, the greatest care and attention was bestowed upon the corrections of the instruments, used in effecting the registrations, and that the numerous comparisons with other standard instruments proved the identity of the Melbourne standard and those of Kew and Berlin. The instruments of the Flagstaff Observatory were of the very best description, and their mounting was as perfect as circumstances would allow. The little house, forming the receptacle for the barometers, consisted of two rooms and was built of wood, but we must not forget, that the instruments were fixed to a solid brick pillar of four feet in diameter. Notwithstanding there being little chance that such a substantial mass of stone could be moved by the effect of heavy winds, it was still considered advisable to check the firmness of the barometer-mountings by delicate levels in the manner already described (R. II. pag. 2). The results were also in this case highly satisfactory. It was by far less easy a task to reduce the oscillations of the temperature to a minimum, the walls of the house offering too little resistance on account of their slight construction; however, as the Standard barometer was attached to the south side of the pillar above mentioned, and as invariably the greatest care was taken to keep out the direct rays of the sun, we may also in this respect receive the results, bearing on pressure of air, with the utmost confidence.

When the observatory was transferred to its present position (on the 21st of Sept. 62), the barometer was placed in the new transit room, whereby was secured to this important branch of meteorological inquiry a most suitable and unobjectionable locality. The difference of elevation above the level of the sea between the former and the present position of the instrument involved a difference in atmospheric pressure of 0.029 inches, which amount was subtracted from all readings subsequent to the day of removal in order to reduce all registrations to one and the same elevation viz: 120.7 feet, this being the height above the mean level of the sea of the cistern of the standard barometer at the Flagstaff Observatory. With respect to the exact time the observations have been recorded, it will be sufficient to repeat, that the barometer was invariably read one minute before the full hour, the latter being required for the registration of the magnetical instruments.

9. With a view to give an exact idea of the annual march of pressure of air, a general mean for each day was derived, by combining the daily means for each of the five years of observation. The daily means in the subsequent table therefore represent 120 single readings, and we are inclined to believe that these values fairly express the actual march of atmospheric pressure throughout the year. From the fact that the monthly and quarterly means have been got irrespectively of the division of the year, in periods of five days, it becomes evident that the results arrived at cannot exactly tally with those of the penthemeral tables, a point which must not be forgotten when comparing the various values. This applies more especially to the monthly, quarterly and yearly mean pressure of air for the single years of observation.

ANNUAL MARCH OF PRESSURE OF AIR.

(Mean for five years: 29·8951 inches.)

1858—63.		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	Septbr.	October.	Novbr.	Decemb.	January.	Febr.
		inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
1 st		29·8564	29·9962	29·8794	29·9072	29·9290	30·1470	30·0304	29·8488	29·7486	29·7372	29·7534	29·8404
2 ^d		29·8780	29·9398	29·9898	29·9798	29·9540	30·1710	30·0402	29·8810	29·7840	29·6326	29·7750	29·8418
3 ^d		29·8560	29·8858	30·0442	30·0540	29·9594	30·1704	30·0860	30·0380	29·8728	29·6732	29·7998	29·7908
4 th		29·7942	29·8802	30·0848	30·1160	29·9260	30·1494	30·0072	30·0468	29·9288	29·7918	29·7898	29·7744
5 th		29·8834	29·8374	30·1072	30·1502	29·9286	30·0598	29·9328	30·0200	29·9252	29·8122	29·8282	29·8438
6 th		29·8994	29·8622	30·1258	30·1138	29·9198	30·0210	29·9190	29·9514	29·9334	29·8132	29·8790	29·8780
7 th		29·8690	29·9044	30·1174	30·0310	29·9286	29·9834	29·8698	29·8328	29·9194	29·8132	29·8236	29·8696
8 th		29·8562	29·9956	30·0864	29·9214	29·9762	29·9656	29·8030	29·7690	29·9372	29·8098	29·7590	29·8174
9 th		29·8242	30·0354	30·0608	29·8394	29·9324	29·9690	29·8266	29·9218	29·9118	29·8070	29·6932	29·7990
10 th		29·8946	29·9214	30·0536	29·8992	29·9002	29·8526	29·9020	29·8658	29·8660	29·7130	29·7078	29·8496
11 th		29·9462	29·7856	29·9248	29·9626	29·8760	29·8212	29·8536	29·8762	29·8354	29·7478	29·7572	29·7546
12 th		29·9672	29·9484	29·7492	30·0126	29·8554	29·9110	29·9330	29·9324	29·9386	29·7044	29·8606	29·7762
13 th		29·9664	30·0276	29·8118	30·0740	29·9000	29·9460	29·8288	29·9546	29·8606	29·7374	29·8032	29·8108
14 th		29·9286	30·0412	29·9134	30·1168	29·8380	30·0334	29·7426	29·9390	29·8882	29·7492	29·7264	29·7604
15 th		29·9080	29·9450	29·8386	30·1232	29·8196	30·0302	29·7856	29·9180	29·9924	29·7228	29·7506	29·7314
16 th		29·7886	29·9414	29·8084	30·0308	29·9472	30·0328	29·8608	29·8868	29·9294	29·7194	29·7954	29·7320
17 th		29·8010	29·9600	29·7502	29·9358	30·0278	30·0850	29·9278	29·9888	29·7850	29·7648	29·8052	29·7068
18 th		29·8942	30·0120	29·7768	29·8394	30·0888	30·0364	29·8914	29·9220	29·7928	29·7316	29·7798	29·7270
19 th		29·8992	30·0880	29·7646	29·8048	30·1130	29·9342	29·8742	29·8476	29·7700	29·6446	29·8452	29·7762
20 th		29·8694	30·1688	29·8206	29·8262	30·0466	29·8722	29·8402	29·8872	29·8172	29·6566	29·8130	29·7880
21 st		29·9356	30·1220	29·8728	29·8412	29·9330	29·7906	29·7672	29·9114	29·8390	29·7800	29·6350	29·8692
22 ^d		29·9422	30·0146	29·9286	29·8964	29·9518	29·8716	29·7360	29·9366	29·8052	29·7606	29·5966	29·8226
23 ^d		29·9040	29·9440	29·9664	29·7624	29·8796	29·9392	29·8016	29·9022	29·7422	29·7368	29·7766	29·7658
24 th		29·9380	30·0340	29·9264	29·9080	29·9724	29·9838	29·9114	29·9226	29·8038	29·8302	29·8470	29·8432
25 th		29·9396	30·0980	29·9288	29·8540	30·0310	30·0776	29·9430	29·9994	29·8388	29·8518	29·7574	29·9638
26 th		29·9880	30·1060	29·8716	29·9286	29·9540	30·0204	29·8458	29·9460	29·8694	29·7922	29·7734	29·9578
27 th		30·0584	30·0384	29·8074	29·8974	29·9646	29·9450	29·8004	29·8282	29·8622	29·8028	29·8346	29·9784
28 th		30·0266	29·9460	29·8880	29·9190	30·0222	30·0182	29·8354	29·7358	29·8740	29·8902	29·8242	29·9152
29 th		29·9976	29·8950	29·9172	29·9590	30·0902	30·0616	29·8470	29·8190	29·8598	29·9810	29·7916	
30 th		29·9266	29·8702	29·9078	29·9032	30·1474	29·9962	29·9040	29·8252	29·8354	29·9298	29·8502	
31 st		30·0174		29·8892		30·1586	30·0194		29·8150		29·8166	29·8010	
MEANS	observed	29·9114	29·9748	29·9230	29·9536	29·9668	29·9973	29·8782	29·9022	29·8589	29·7727	29·7817	29·8209
	calculated	29·9260	29·9570	29·9114	29·9701	29·9813	29·9901	29·9122	29·8575	29·8308	29·7958	29·7609	29·8244
	calc. — observ.	—0·0146	+0·0178	+0·0116	—0·0165	—0·0145	+0·0072	—0·0340	+0·0447	+0·0281	—0·0231	+0·0208	—0·0035
MEANS FOR THE QUARTERS.		29·9360			29·9728			29·8801			29·7908		

From these values may be derived the annual equation for pressure of air as follows:

$$P^{(n)} = 29.8951 + 0.089 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 242^\circ 36' \right\} + 0.028 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 211^\circ 18' \right\} \\ + 0.028 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 111^\circ 16' \right\} + \dots;$$

By this formula the monthly means have been computed, as inserted at the foot of the above table, and the differences underneath show how closely the formula corresponds with the results derived from actual observation, the mean error amounting to ± 0.0197 inch. only.

By the above table we obtain the maximum and minimum respectively on the 2^d of August and the 22^d of January; a further discussion of the formula yields as the annual extremes in mean pressure of air these results: Maximum on the 24th of July viz: 29.9847 inches and Minimum on the 12th of January viz: 29.7603 inches. The actual extremes in this meteorological element must not necessarily occur on the days just pointed out, it may even happen that an absolute extreme occurs at or about the time indicated to be a relative extreme of the opposite character. So for instance, is the maximum to take place on the 24th of July, but on the 23^d of the same month in 1862 was recorded the absolute minimum for the entire year. This apparent contradiction is readily accounted for by great atmospheric disturbances, which cause the time of occurrence of the absolute extremes to be very irregular. In connexion with this question it is a fact worthy of being noticed, that for the years 1859 and 60 the absolute maximum took place on the same day and hour viz: 2.4 of July, the amount of 30.560 inches being also nearly alike in both cases. Penthemeral means do perhaps still better illustrate the distribution of atmospheric pressure throughout the year.

Mean „Five day Means“ in Pressure of Air for the years 1858 to 1863.

NUMBER OF THE PERIOD in the resp. MONTHS.	Jan. (1—5)	Febr. (31—4)	March. (2—6)	April. (1—5)	May. (1—5)	June. (31—4)	July. (5—9)	Aug. (4—8)	Sept. (3—7)	Octbr. (3—7)	Nov. (2—6)	Dec. (2—6)
	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
1	29.7890	29.8098	29.8582	29.9078	30.0204	29.9892	29.9372	30.0358	29.9630	29.9774	29.8886	29.7454
2	29.7724	29.8402	29.8782	29.9436	30.0890	30.0112	29.8746	29.9000	29.8636	29.8726	29.8934	29.7782
3	29.7794	29.7902	29.9114	29.9496	29.8476	30.0130	29.9996	30.0436	29.8290	29.9332	29.9216	29.7262
4	29.8074	29.7348	29.8798	30.0322	29.7834	29.9468	29.9570	29.8814	29.8190	29.9008	29.8006	29.7152
5	29.7224	29.8175	29.9422	30.0422	29.9244	29.8868	30.0124	30.0046	29.8606	29.9196	29.8116	29.7940
6	29.8146	29.9410	30.0054	29.9712	29.8784	29.9118	30.1588	30.0298	29.8654	29.7886	29.8336	29.8840
						29.9344						

From this we perceive that the penthemeral maximum occurs in the sixth period of the month of July (between the 30th of July and the 3^d of Aug.), while as a minimum is characterised the 4th period in the month of December (17th to 21st). The influence of the mean direction of the wind on the atmospheric pressure is also clearly exhibited in the above table, as we shall have to show when speaking on this subject.

A few words only about the oscillations in mean pressure of air during the period of observation. From the little table below we learn that the yearly mean pressure increased towards the year 1860/61, reaching in that year its maximum value. In 1862/63 occurred the minimum, the whole range of observation amounting to 0.0398. This oscillation makes itself manifest also in the several quarters, autumn alone forms an exception.

From the 2d of March to the 1st. of March.	1858/59.	1859/60.	1860/61.	1861/62.	1862/63.	1858—63
	inches.	inches.	inches.	inches.	inches.	inches.
Autumn . . .	29.9703	29.9210	29.9293	29.9527	29.9107	29.9368
Winter . . .	29.9190	30.0187	30.0743	29.9293	29.9390	29.9761
Spring . . .	29.8520	29.8983	29.8783	29.8733	29.8716	29.8747
Summer . . .	29.7840	29.8107	29.7943	29.7793	29.7960	29.7928
Year . . .	29.8813	29.9122	29.9191	29.8837	29.8793	29.8951

10. Diurnal fluctuation of pressure of air. For the year 1858/59 the hourly variation table has been already published (R. I. page 56), and for the subsequent years the corresponding tables may be found in appendix 8. The combination of these several tables resulted the one in this paragraph.

HOUR	During the years 1858 to 1863.												Year
	March.	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
Midnight	29.915	29.983	29.928	29.972	29.984	29.985	29.884	29.913	29.866	29.784	29.792	29.826	29.9027
1h AM	29.909	29.980	29.922	29.966	29.977	29.981	29.882	29.906	29.854	29.775	29.782	29.817	29.8959
2	29.902	29.973	29.918	29.967	29.976	29.976	29.872	29.899	29.846	29.763	29.772	29.809	29.8894
3	29.897	29.964	29.912	29.962	29.969	29.968	29.862	29.895	29.843	29.760	29.766	29.805	29.8836
4	29.897	29.963	29.910	29.958	29.968	29.964	29.862	29.894	29.846	29.765	29.770	29.806	29.8836
5	29.904	29.970	29.913	29.960	29.969	29.970	29.869	29.904	29.857	29.776	29.781	29.815	29.8907
6	29.919	29.976	29.918	29.966	29.977	29.978	29.880	29.918	29.867	29.784	29.793	29.826	29.9002
7	29.934	29.988	29.927	29.975	29.990	29.991	29.893	29.931	29.880	29.794	29.803	29.836	29.9118
8	29.943	30.000	29.939	29.985	30.000	30.001	29.900	29.936	29.889	29.799	29.807	29.842	29.9201
9	29.947	30.005	29.946	29.995	30.009	30.007	29.902	29.939	29.882	29.796	29.806	29.846	29.9233
10	29.944	30.000	29.944	29.999	30.013	30.006	29.897	29.932	29.878	29.793	29.802	29.843	29.9209
11	29.933	29.993	29.936	29.990	30.006	29.993	29.884	29.920	29.867	29.786	29.797	29.835	29.9121
Noon	29.914	29.976	29.917	29.969	29.985	29.980	29.870	29.908	29.856	29.776	29.785	29.823	29.8966
1h PM	29.904	29.957	29.901	29.950	29.967	29.961	29.852	29.897	29.846	29.764	29.775	29.812	29.8822
2	29.891	29.946	29.892	29.943	29.958	29.949	29.842	29.883	29.834	29.752	29.763	29.799	29.8710
3	29.883	29.943	29.891	29.939	29.959	29.947	29.841	29.870	29.827	29.741	29.754	29.789	29.8653
4	29.879	29.942	29.896	29.944	29.962	29.946	29.834	29.872	29.826	29.736	29.746	29.783	29.8638
5	29.885	29.947	29.902	29.951	29.969	29.953	29.842	29.877	29.829	29.737	29.746	29.784	29.8685
6	29.896	29.960	29.914	29.960	29.978	29.965	29.855	29.889	29.844	29.754	29.755	29.795	29.8804
7	29.908	29.974	29.927	29.969	29.988	29.976	29.868	29.904	29.860	29.769	29.774	29.812	29.8941
8	29.922	29.982	29.930	29.976	29.994	29.984	29.877	29.919	29.872	29.780	29.787	29.826	29.9041
9	29.929	29.988	29.935	29.981	29.997	29.989	29.885	29.923	29.881	29.792	29.801	29.836	29.9114
10	29.932	29.989	29.935	29.981	29.997	29.989	29.885	29.920	29.880	29.795	29.801	29.834	29.9115
11	29.927	29.983	29.930	29.981	29.995	29.981	29.881	29.917	29.877	29.792	29.801	29.834	29.9083

Adopting these values as a base, we obtain according to Bessel's interpolation formula the following equations, expressing the diurnal fluctuation in atmospheric pressure for the several months and for the year:

$$\begin{aligned}
\text{for March } P^{(n)} &= 29.9131 + 0.0114 \sin(n15^\circ + 277^\circ 4') + 0.0252 \sin(n30^\circ + 167^\circ 46') \\
&\quad + 0.0009 \sin(n45^\circ + 275^\circ 12') + \dots \\
\text{,, April} &= 29.9743 + 0.0114 \sin(n15^\circ + 188^\circ 26') + 0.0215 \sin(n30^\circ + 161^\circ 55') \\
&\quad + 0.0028 \sin(n45^\circ + 162^\circ 39') + \dots \\
\text{,, May} &= 29.9201 + 0.0081 \sin(n15^\circ + 212^\circ 23') + 0.0197 \sin(n30^\circ + 170^\circ 59') \\
&\quad + 0.0054 \sin(n45^\circ + 181^\circ 46') + \dots \\
\text{,, June} &= 29.9683 + 0.0080 \sin(n15^\circ + 194^\circ 28') + 0.0198 \sin(n30^\circ + 166^\circ 22') \\
&\quad + 0.0058 \sin(n45^\circ + 175^\circ 2') + \dots \\
\text{,, July} &= 29.9828 + 0.0041 \sin(n15^\circ + 177^\circ 40') + 0.0210 \sin(n30^\circ + 168^\circ 47') \\
&\quad + 0.0053 \sin(n45^\circ + 180^\circ 54') + \dots \\
\text{,, August} &= 29.9769 + 0.0113 \sin(n15^\circ + 188^\circ 29') + 0.0212 \sin(n30^\circ + 166^\circ 8') \\
&\quad + 0.0052 \sin(n45^\circ + 182^\circ 46') + \dots \\
\text{,, Septbr.} &= 29.8716 + 0.0156 \sin(n15^\circ + 199^\circ 24') + 0.0215 \sin(n30^\circ + 168^\circ 10') \\
&\quad + 0.0032 \sin(n45^\circ + 218^\circ 40') + \dots \\
\text{,, October} &= 29.9069 + 0.0135 \sin(n15^\circ + 187^\circ 47') + 0.0235 \sin(n30^\circ + 171^\circ 38') \\
&\quad + 0.0002 \sin(n45^\circ + 45^\circ 0') + \dots \\
\text{,, Novbr.} &= 29.8586 + 0.0107 \sin(n15^\circ + 204^\circ 22') + 0.0241 \sin(n30^\circ + 174^\circ 14') \\
&\quad + 0.0030 \sin(n45^\circ + 355^\circ 14') + \dots \\
\text{,, Decbr.} &= 29.7735 + 0.0137 \sin(n15^\circ + 199^\circ 32') + 0.0226 \sin(n30^\circ + 165^\circ 15') \\
&\quad + 0.0039 \sin(n45^\circ + 12^\circ 16') + \dots \\
\text{,, Jan.} &= 29.7816 + 0.0133 \sin(n15^\circ + 192^\circ 18') + 0.0227 \sin(n30^\circ + 161^\circ 22') \\
&\quad + 0.0049 \sin(n45^\circ + 357^\circ 5') + \dots \\
\text{,, Febr.} &= 29.8180 + 0.0123 \sin(n15^\circ + 186^\circ 36') + 0.0228 \sin(n30^\circ + 161^\circ 42') \\
&\quad + 0.0025 \sin(n45^\circ + 19^\circ 39') + \dots \\
\text{Year} &= 29.8955 + 0.0100 \sin(n15^\circ + 195^\circ 1') + 0.0221 \sin(n30^\circ + 167^\circ 21') \\
&\quad + 0.0011 \sin(n45^\circ + 186^\circ 46') + \dots
\end{aligned}$$

The results of the elaborate task of computing the hourly values of atmospheric pressure for the several months and the year are embodied in the subsequent table in which are given the differences: calculated minus observed values of the diurnal fluctuation of pressure of air.

Hour	During the years 1858 to 1863												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
Midnight	+0.004	-0.001	0.000	+0.002	+0.003	-0.001	-0.001	-0.001	0.000	-0.001	0.000	0.000	+0.0004
1h AM	-0.001	-0.004	+0.001	+0.004	+0.004	-0.002	-0.005	-0.003	0.000	-0.003	-0.002	-0.001	-0.0011
2	-0.002	-0.003	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.001	+0.001	-0.001	-0.001	-0.0020
3	-0.002	+0.002	0.000	-0.002	0.000	+0.001	+0.003	0.000	-0.001	+0.002	+0.005	0.000	-0.0004
4	+0.001	+0.002	0.000	0.000	-0.002	+0.003	+0.002	+0.004	+0.001	+0.001	+0.002	+0.002	+0.0003
5	+0.002	-0.002	-0.002	-0.001	0.000	0.000	+0.001	+0.002	0.000	-0.001	0.000	0.000	-0.0011
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.001	+0.002	0.000	-0.001	-0.001	-0.0011
7	-0.001	-0.001	+0.002	+0.001	0.000	-0.001	-0.002	-0.003	-0.001	-0.001	-0.005	-0.001	-0.0018
8	0.000	-0.003	0.000	+0.003	+0.002	0.000	0.000	0.000	-0.004	-0.001	0.000	0.000	-0.0012
9	0.000	-0.002	-0.001	0.000	+0.001	+0.001	0.000	-0.001	+0.002	+0.002	+0.001	-0.001	-0.0003
10	-0.001	+0.002	0.000	-0.004	-0.003	+0.001	0.000	+0.002	+0.001	+0.001	+0.001	0.000	-0.0006
11	0.000	+0.001	-0.002	-0.003	-0.004	-0.002	+0.001	+0.003	+0.002	0.000	+0.002	+0.001	-0.0009
Noon	+0.004	+0.004	+0.002	+0.002	+0.002	0.000	-0.001	+0.001	0.000	0.000	+0.001	+0.002	+0.0011
1h PM	-0.002	+0.007	+0.002	+0.005	+0.004	+0.002	+0.001	-0.004	-0.002	-0.001	-0.001	-0.001	+0.0008
2	-0.002	+0.001	0.000	0.000	+0.002	0.000	-0.001	-0.003	-0.001	-0.001	0.000	-0.001	0.0000
3	-0.001	-0.001	-0.002	-0.001	-0.003	-0.003	-0.005	+0.003	0.000	0.000	-0.005	-0.001	-0.0007
4	+0.001	0.000	-0.002	-0.003	-0.002	0.000	+0.004	0.000	0.000	+0.001	+0.001	+0.001	+0.0011
5	+0.001	+0.001	+0.002	-0.001	0.000	+0.002	+0.003	+0.002	+0.003	+0.004	+0.002	+0.002	+0.0029
6	0.000	-0.001	+0.002	+0.002	+0.002	-0.001	0.000	+0.001	0.000	-0.003	+0.001	+0.001	+0.0017
7	+0.001	-0.003	-0.002	+0.002	+0.001	0.000	-0.002	-0.001	-0.002	-0.003	0.000	-0.002	+0.0001
8	-0.001	-0.001	+0.001	+0.001	+0.001	-0.001	-0.002	-0.004	0.000	+0.001	0.000	-0.002	+0.0006
9	0.000	-0.001	-0.001	-0.002	0.000	-0.002	-0.002	-0.001	0.000	+0.001	-0.002	-0.002	-0.0002
10	-0.001	-0.001	-0.002	-0.002	-0.002	-0.001	+0.002	+0.004	+0.002	+0.002	+0.004	+0.004	+0.0014
11	0.000	+0.003	+0.001	-0.004	-0.003	+0.006	+0.006	+0.003	0.000	+0.001	-0.003	0.000	+0.0015

The smallness of these differences and the changing character of the algebraic sign sufficiently illustrate the reliability of the equations proposed. A complete discussion of the same with a view to determine the tropical hours and the corresponding extremes in pressure of air resulted thus:

MONTHS.	MAXIMUM.				MINIMUM.			
	A.		M.		A.		M.	
	Time.	Amount.	Time.	Amount.	Time.	Amount.	Time.	Amount.
March . . .	h. m.	inch.	h. m.	inch.	h. m.	inch.	h. m.	inch.
March . . .	9 2	29.9468	9 52	29.9310	3 9	29.8954	3 39	29.8800
April . . .	9 25	30.0034	9 57	29.9885	3 42	29.9644	3 33	29.9411
May . . .	9 18	29.9456	9 18	29.9340	4 8	29.9096	2 53	29.8890
June . . .	9 29	29.9964	9 19	29.9798	4 14	29.9574	3 4	29.9377
July . . .	9 30	30.0112	8 59	29.9966	4 1	29.9664	3 0	29.9557
August . . .	9 20	30.0086	9 56	29.9880	3 59	29.9669	3 10	29.9436
September . .	8 52	29.9026	10 31	29.8873	3 36	29.8640	3 14	29.8359
October . . .	8 51	29.9382	9 46	29.9239	2 54	29.8945	3 34	29.8717
November . .	8 27	29.8853	9 43	29.8828	2 51	29.8424	3 37	29.8257
December . .	8 34	29.7984	9 58	29.7967	2 49	29.7619	4 4	29.7374
January . . .	8 33	29.8074	10 7	29.8048	2 55	29.7676	4 21	29.7465
February . .	9 5	29.8452	9 59	29.8378	3 0	29.8049	4 6	29.7836
Year . . .	9 7	29.9231	9 50	29.9130	3 23	29.8829	3 27	29.8639

The secondary maximum, occurring in the evening, is on an average 0.0101 inches less than the maximum in the morning, this difference decreasing during the summer months, while the minimum in the morning exceeds that in the afternoon by 0.0190 inches.

11. Another question bearing a close relation to the one just treated may find a place here, namely the range in pressure of air during a day, month, year and for the whole period of observation. The subjoined table gives the leading features.

1858-63.	MEAN RANGE.		1858-63.	MEAN RANGE.	
	daily.	monthly.		daily.	monthly.
	inch.	inch.		inch.	inch.
March . . .	0.1548	0.6788	June . . .	0.1504	0.9798
April . . .	0.1524	0.8612	July . . .	0.1492	0.8326
May . . .	0.1600	0.9676	August . .	0.1658	0.9240
Autumn . .	0.15573	0.82253	Winter . .	0.15513	0.91213
September .	0.1928	1.0424	December .	0.1858	0.9426
October . .	0.1920	0.9272	January .	0.1802	0.7578
November .	0.1918	0.8102	February .	0.1430	0.7350
Spring . .	0.19220	0.92660	Summer .	0.16967	0.81180
Year . . .	0.16818	0.86826	M. Yearly R.	1.4198	
R. during the entire Period of obs. 1.7140				$\left. \begin{array}{l} \text{Min. } \frac{19}{\text{XII}} \text{ } 58 \\ \text{Max. } \frac{15.4}{\text{VI}} \text{ } 62 \end{array} \right\}$	

12. Barometric windrose. The method according to which the means of pressure of air for each point of the compass (Appendix 9) have been reduced to mean values for sixteen points only has been already explained, when speaking on the general principles adopted in discussing the observations, and it hardly require, any further remarks to cause the subjoined table to be fully understood.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29.9664	30.0418	30.0368	30.1420	30.1113	30.0179	29.9577	29.9648	29.9324	29.8273	29.8431	29.8418
S.S.E.	29.9714	30.0349	30.0131	30.0531	30.0673	30.0790	29.8835	30.0112	29.9401	29.8380	29.8615	29.8571
S.E.	29.9841	30.0554	30.0009	30.1486	30.0357	30.1910	29.9766	29.9983	29.9245	29.8690	29.8106	29.8643
E.S.E.	29.9789	30.0621	30.0277	30.1715	30.0930	30.2681	29.9420	29.9985	29.9160	29.8289	29.8080	29.8719
E.	29.9511	30.0796	30.0609	30.1020	30.1066	30.0925	29.9412	29.9566	29.8629	29.7682	29.7693	29.8691
E.N.E.	29.9576	30.0196	29.9968	30.1280	30.0660	30.0420	29.9666	29.9155	29.8850	29.7329	29.8181	29.8268
N.E.	29.9284	29.9793	30.0028	30.0122	30.0484	30.0285	29.9321	29.8935	29.8087	29.6872	29.7605	29.8032
N.N.E.	29.8698	29.8978	29.8476	29.9361	29.9499	29.9937	29.8634	29.8074	29.7886	29.6950	29.7380	29.7472
N.	29.8523	29.8848	29.8126	29.8807	29.9084	29.8907	29.8290	29.7782	29.7435	29.6207	29.6743	29.7338
N.N.W.	29.8433	29.8847	29.7790	29.8390	29.8568	29.8970	29.8227	29.8220	29.7450	29.6152	29.6526	29.6926
N.W.	29.8810	29.9628	29.9118	29.8902	29.9143	29.8796	29.7576	29.8277	29.7615	29.7097	29.7129	29.7263
W.N.W.	29.8414	29.9173	29.9445	29.9210	29.9237	29.9232	29.8575	29.8400	29.7751	29.7355	29.6665	29.7577
W.	29.8621	29.9291	29.9658	29.9302	29.9438	30.0311	29.8602	29.8521	29.8069	29.7363	29.6901	29.7958
W.S.W.	29.8730	29.9642	29.9736	30.0180	30.0433	29.9928	29.8540	29.9044	29.8294	29.7169	29.7135	29.7970
S.W.	29.8920	30.0073	30.0496	30.0855	30.0577	30.0260	29.8714	29.8909	29.8713	29.8017	29.7572	29.8225
S.S.W.	29.9084	30.0171	30.0515	30.1020	30.1106	30.0710	29.9618	30.0040	29.9290	29.8217	29.8384	29.8315
u =	29.91007	29.98361	29.96718	30.02250	30.01480	30.02650	29.89230	29.90407	29.84499	29.75026	29.75716	29.80265

«u» is simply the arithmetical mean for any of the 16 constituting values, irrespective of the relative frequency of the wind, and it is evident that these values are not influenced by the properties of any special wind, while on the other hand the general mean of the month must necessarily be affected by the properties of the predominating wind with special regard to atmospheric pressure. If we call the general means for the several months m , $u - m$ throughout the year results thus:

March: -0.0013 (S.S.W.); April: $+0.0088$ (N.W. by W.); May: $+0.0442$ (N.N.W.); June: $+0.0689$ (N. by E.); July: $+0.0480$ (N. $\frac{1}{2}$ W.); August: $+0.0292$ (N.N.W.); September: $+0.0141$ (N.N.W.); October: $+0.0019$ (W. by N.); November: -0.0139 (S.W. by S.); December: -0.0224 (S.S.W.); January: -0.0245 (S.S.W.); February: -0.0183 (S. by W.); Year $+0.0012$ (N.W. $\frac{1}{2}$ W). *)

The wind-directions within the brackets are the monthly mean directions, given only to the nearest point; for the exact values may be referred to the paragraph treating on the mean direction of the wind at Melbourne. Glancing over the above series we perceive at once that the algebraic sign changes with the change of wind from S. to N., that northerly winds cause the barometer to be too low and southerly breezes, to be too high, the amount depending to a great extent on the greater or smaller degree of predomination of a certain wind, as may best be learnt by comparing those amounts with the resultants of wind for each respective month.

To illustrate this influence of the direction of the wind on the pressure of air still further, and with the object of constructing a formula, in which the atmospheric pressure appears as a function of the wind's direction, the results for three months have been reduced to quarterly means. The process adopted in effecting this reduction has already been explained elsewhere and is chiefly calculated to eliminate irregularities caused by the inequality in the frequency of winds.

By Bessel's interpolation formula we obtain these equations:

$$\begin{aligned} \text{For Autumn } b^{(m)} &= 29.9476 + 0.0736 \sin(m 22^\circ 30' + 56^\circ 48') + 0.0588 \sin(m 45^\circ 0' + 269^\circ 2') + \dots \\ \text{,, Winter} &= 30.0194 + 0.1191 \sin(m 22^\circ 30' + 49^\circ 32') + 0.0718 \sin(m 45^\circ 0' + 241^\circ 56') + \dots \\ \text{,, Spring} &= 29.8831 + 0.0862 \sin(m 22^\circ 30' + 56^\circ 10') + 0.0158 \sin(m 45^\circ 0' + 204^\circ 37') + \dots \\ \text{,, Summer} &= 29.7687 + 0.0861 \sin(m 22^\circ 30' + 62^\circ 40') + 0.0114 \sin(m 45^\circ 0' + 272^\circ 1') + \dots \\ \text{,, the Year} &= 29.8996 + 0.0825 \sin(m 22^\circ 30' + 54^\circ 15') + 0.0389 \sin(m 45^\circ 0' + 231^\circ 29') + \dots \end{aligned}$$

The table below shows the observed and calculated values, as also their differences.

*) Compare these results with the penthemeral values of atmospheric pressure and mean direction of wind.

DIRECTION OF WIND.	Derived from observations during the years 1858 to 63.														
	AUTUMN			WINTER			SPRING			SUMMER			YEAR		
	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29·9798	30·0015	—0·0217	30·0783	30·0822	—0·0039	29·9514	29·9507	+0·0007	29·8377	29·8357	+0·0020	29·9513	29·9554	—0·0041
S.S.E.	·9988	·0011	—·0023	·0983	·0672	+·0311	·9602	·9562	+·0040	·8486	·8540	—·0054	·9606	·9619	—·0013
S.E.	30·0192	·0125	+·0067	·1212	·1192	+·0020	·9605	·9629	—·0024	·8490	·8460	+·0030	·9689	·9707	—·0018
E.S.E.	·0288	·0152	+·0136	·1360	·1751	—·0391	·9521	·9497	+·0024	·8372	·8373	—·0001	·9719	·9690	+·0029
E.	·0173	·0093	+·0080	·1284	·1043	+·0241	·9344	·9133	+·0211	·8130	·7970	+·0160	·9630	·9440	+·0190
E.N.E.	29·9824	29·9885	—·0061	·0905	·0886	+·0019	·9074	·9274	—·0200	·7797	·7892	—·0095	·9378	·9465	—·0087
N.E.	·9330	·9716	—·0386	·0269	·0284	—·0015	·8736	·8893	—·0157	·7430	·7489	—·0059	·8984	·9175	—·0191
N.N.E.	·8857	·8668	+·0189	29·9548	29·9597	—·0049	·8881	·8270	+·0111	·7103	·7274	—·0171	·8540	·8497	+·0043
N.	·8566	·8415	+·0151	·8971	·8957	+·0014	·8082	·7913	+·0169	·6883	·6715	+·0168	·8175	·8033	+·0142
N.N.W.	·8540	·8231	+·0309	·8717	·8637	+·0080	·7912	·8024	—·0112	·6810	·6499	+·0311	·8000	·7857	+·0143
N.W.	·8750	·9210	—·0460	·8838	·8960	—·0122	·7913	·7798	+·0115	·6888	·7190	—·0302	·8061	·8279	—·0218
W.N.W.	·9072	·9157	—·0085	·9238	·9218	+·0020	·8087	·8301	—·0214	·7086	·7183	—·0097	·8317	·8480	—·0163
W.	·9367	·9261	+·0106	·9738	·9717	+·0021	·8384	·8422	—·0038	·7358	·7392	—·0034	·8666	·8693	—·0027
W.S.W.	·9550	·9387	+·0163	30·9171	30·0107	+·0064	·8736	·8621	+·0115	·7655	·7413	+·0242	·9000	·8816	+·0184
S.W.	·9632	·9632	·0000	·0457	·0376	+·0081	·9070	·8800	+·0270	·7940	·7935	+·0005	·9250	·9104	+·0146
S.S.W.	·9687	·9654	+·0033	·0630	·0881	—·0251	·9337	·9656	—·0319	·8187	·8315	—·0128	·9408	·9530	—·0122
u =		29·9476			30·0194			29·8831			29·7687			29·8996	

The influence of the mean direction of the wind on the barometer, manifests itself more strikingly in this case, for we have $u - m$ in Autumn: + 0·0116 inch. (N.W. $\frac{1}{2}$ N.); Winter: + 0·0466 inch. (N. by W.); Spring: + 0·0030 inch. (W.N.W. $\frac{1}{2}$ W.); Summer: — 0·0221 inch. (S.S.W.) and the year: + 0·0045 inch. (N.W. $\frac{1}{2}$ W.). We perceive from this that at Melbourne the barometer is too low by 0·0045 inches on an average, in consequence of the mean direction of wind.

From the smallness of these differences and the alternating character of the sign we may well arrive at the conclusion that the formulae fairly express the real state of things; for the mean errors for the various seasons, commencing with autumn, and for the year are as follows: $\pm 0\text{'0154}$, 0'0108 , 0'0133 , 0'0117 and $\pm 0\text{'01098}$.

A close examination of the equations with a view to determine the exact positions of the extreme and mean values as well, as their actual amount, gives the subjoined satisfactory results:

PERIOD.	MAXIMUM.		MINIMUM.		MEAN.
	position.	value.	position.	value.	positions.
Autumn . .	S. 67° 50' E.	30·0289	S. 193° 10' E.	29·8518	S. 128° 40' E. and S. 281° 24' E.
Winter . .	72° 50'	30·1366	206° 10'	29·8713	138° 28' 293° 58'
Spring . .	34° 32'	29·9614	213° 31'	29·7890	129° 0' 298° 37'
Summer . .	34° 43'	29·8503	201° 44'	29·6810	119° 15' 294° 56'
Year . . .	63° 54'	29·9721	208° 2'	29·7993	134° 25' 292° 12'

We glean from the above the interesting fact, that the barometrical range within the windrose shows a maximum in winter of 0·2653, and a minimum of 0·1693, the equinoctial

seasons, spring and autumn, being characterised by intermediate values of respectively 0".1724 and 0".1771; the mean value for the year amounts therefore to 0".1828.

13. It is of considerable interest to examine somewhat closer into the nature of the atmospheric pressure during calms, and it may here be mentioned that only such cases were taken into consideration, where it was absolutely impossible to perceive any draught of air. In the little table below the differences between the general mean pressure for a certain month or quarter and the corresponding mean pressure during calms are placed beside the latter amounts.

(Total number of observations = 1484.)

1858—63.	Mean Pr. minus Pressure in Calms.	PRESSURE.	1858—63.	Mean Pr. minus Pressure in Calms.	PRESSURE.
	inch.	inch.		inch.	inch.
March . . .	+0.0024	29.9090	June . . .	—0.1554	30.1090
April . . .	—0.0872	30.0620	July . . .	—0.1342	30.1010
May . . .	—0.0950	30.0180	August . .	—0.2521	30.2494
Autumn . .	—0.0662	30.0022	Winter . .	—0.1815	30.1543
September .	—0.2381	30.1163	December .	—0.0210	29.7937
October . .	—0.0506	29.9528	January . .	+0.0154	29.7663
November .	+0.0045	29.8544	February . .	—0.0141	29.8350
Spring . . .	—0.0679	29.9580	Summer . .	—0.0115	29.8023
Year . . .	—0.10580	29.99850			

During the months from October to March the mean pressure of air in calms differs but slightly from the general mean pressure, the algebraic sign of the difference being of an alternating character; during the period between April and September calms are accompanied by a high barometer, exceeding the general mean pressure in August by 0".2521 and in September by 0".2381. We recognise in this division of the year the same two periods spoken of in the chapter about the mean direction of the wind, the one being characterized by northerly (April to September), the other by southerly winds (October to March).

14. The influence of the moon on the barometer, a topic still insufficiently investigated, was made the subject of this paragraph. Apart from the general interest which is universally attached to so important a question, it is of special interest to show, how far from the equator the moon's influence on our atmosphere can be proved by the means at present at our command. The latitude of the Flagstaff Observatory of 37° 48' 45" S. seemed to offer some guarantees for a satisfactory result of an investigation of that kind; how far these expectations have been realized, we must leave to be judged by those who made this topic the object of special studies. So much, however, elicits from the tables subjoined, that an influence of this nature is perceptible even in as high a latitude as that of Melbourne, but that the nonperiodical oscillations in atmospheric pressure are still so great as seriously to interfere with investigations of so delicate a nature. The method followed in carrying out this task is in the main points identical with that proposed by Professor Kreil (*Versuch, den Einfluß des Mondes auf den atmosphärischen Zustand unserer Erde aus einjährigen Beobachtungen zu erkennen* (1841).

In order to cause this method to be fully understood, we cannot do better than translate from Kreil's work some passages, bearing on this subject.

„Intending to inquire into the moon's influence upon the state of the atmosphere according to her various positions with regard to the meridian of a place, we choose for a period the space of time between two consecutive upper transits of the moon; the sets of observations, having been regarded in their mean results as the expression of the sun's effect, are those of the single months. It was therefore required to arrange the remainders, received by subtracting from the single observations the corresponding monthly means, according to their distances from the meridian. For this purpose a table was made for every month which contained as argument the days of the month and as heading of the single columns the distances of the moon from the meridian i. e. the hourangles at the time of observation. In this table were entered the remainders, received in the manner above described, in such a way, that each was placed in that column headed by the hourangle, corresponding to the time of observation from which the remainder was derived. Of the figures in each single column the means were taken, which means represent the moon's influence as resulting from the set of observations of a certain month.“

In our case the original readings of the barometer were as a rule augmented by one inch. in order to avoid the remainders being of a negative character.

To these remarks we have only to add that the barometer readings for 60 single months have been treated in this way, and that subsequently the mean values for the same month of the several years of observation have been combined to one main result for that month. These values are to be found in the subjoined table. The values for the other periods inserted in the table, are simply the means of the values for the months constituting that period.

(Means for five years.)

[illegible]

In order to place in the hands of those, more especially interested in this important branch of meteorological science, as much of the original material as space and time permit, we have embodied in the appendix (10) to this work a table, containing the mean results of the moon's influence for every single month during the five years of observation. It is perhaps not out of place here to throw out the suggestion, that the monthly means should be further examined with special regard to the moon's age, which task could not possibly be included in this work on account of the limited space allotted to meteorological science.

III. TEMPERATURE OF AIR.

15. Undue radiation from the ground and surrounding objects, and inaccuracy of the thermometers, used in effecting registrations of so delicate a nature, are the main sources of errors but too frequently puzzling the mind of meteorologists in the examination of observations on the temperature of our atmosphere. To avoid the first, there is but one way eligible, namely the bulb of the thermometer must be raised at least 10 feet above the ground, within a suitable stand erected in an elevated position so as to admit of a free circulation of air around it; with respect to the second, it is absolutely necessary to compare the adopted standard with those of other observatories and to subject the single instruments to a most rigorous examination with regard to equality of bore. Both these guarantees far a satisfactory result were strictly attended to, and it was made a permanent practice to compare from time to time all thermometers in use. Standard-thermometers from Kew, Berlin and Munich, received at various times, offered an opportunity to establish a reliable standard according to which all instruments registered at and issued by the observatory were graduated. How far we thus succeeded in obviating all undue effect of radiation may best be judged from the results themselves, and in order to explain the means adopted we may be allowed to refer to our previous publications (R. I. page 2 and R. II. page 2 and 3).

The following passage from another publication of the observatory (Climatological outlines, Exhibition catalogue) will be found useful to those who are anxious to form an opinion on the reliability of the results, bearing on the mean value for temperature of air, about to be delineated, and we may for this reason be permitted to quote it here:

„The observations which have been carried on from the year 1842 to 1850, give as a mean of the temperature of air for the above period 57.6° . The single years, however, cannot possibly agree with each other so well on account of the methods applied for determining their means.“

„Commencing with 1842 these values are: 58.3° , 58.3° , 56.6° , 59.3° , 57.3° , 58.0° , 56.2° , 56.1° , 58.7° ending with 1850. From subsequent observations in 1856 and 1857 the mean

value of the temperature is 58.6° and 59.7° , and if we include these results in the above series, the mean temperature for the eleven years mentioned amounts to 57.87° . But this value agrees well with the one derived from hourly observations at the Flagstaff Observatory during the period over which the observations extend viz: 57.832° , this amount representing the mean deduced from the calendar months. The means of the months according to the penthemeral division result a general mean for the year of 57.963° ; and irrespective of the single months, taking but the 73 periods into consideration, the mean for the year amounts to 57.818 ; a result closely corresponding with the value given above.

To show the oscillations in the mean quarterly and mean yearly values, the following table was compiled, in perusing which it must be understood that the divisions are according to the penthemeral system, and therefore cannot be expected to be identical with the corresponding values given of the table in the next paragraph.

From the 2d of March to 1st of March	1858/59	1859/60	1860/61	1861/62	1862/63	1858—63
Autumn .	59.48	57.57	59.75	59.22	58.50	58.904
Winter .	48.87	49.12	48.86	48.68	49.94	49.094
Spring .	57.48	57.55	57.16	58.05	58.81	57.810
Summer .	65.35	67.34	65.69	65.71	66.13	66.044
Year	57.795	57.895	57.865	57.915	58.345	57.963

The differences between the mean values for the several years are indeed very small, the greatest amounting to 0.55° only; the 1st and the last year of observation show the extreme values, while the intermediate years fit in between them so as to form a series, which exhibits a slight increase with regard to mean temperature of air. Whether this is really the case or merely accidental, is scarcely possible to say, but from the fact, that the mean value for the period from 1842 to 1850 and that for 1858 to 1863 so closely coincide, we are led to believe that this apparent increase is not the consequence of an actual change of the mean temperature of air.

16. Annual march of temperature of air. The five mean values for every day throughout the year, there being five years of observation at our command, were combined to form one general mean for each day. Thus it is evident that the figures in the subjoined table represent the mean of 120 single readings of the thermometer. From these values were again derived monthly and quarterly means.

ANNUAL MARCH OF TEMPERATURE OF AIR.

(Mean for the year: 57°832.)

1858—63		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.
1 st		67°90	63°42	57°18	50°64	46°70	46°08	53°16	56°64	59°46	64°72	70°68	66°72
2 ^d		66°56	64°66	53°40	49°48	47°50	46°46	54°80	57°32	58°34	65°26	67°32	68°66
3 ^d		68°70	64°96	53°32	49°44	47°08	48°02	53°74	54°80	56°58	64°30	67°78	68°66
4 th		67°90	61°62	56°86	48°26	48°14	47°64	53°86	55°38	56°74	65°86	66°30	67°62
5 th		63°84	60°74	56°02	47°20	49°58	49°14	55°06	57°14	57°84	63°38	68°72	66°28
6 th		63°24	60°92	55°06	49°10	49°34	48°50	54°22	58°80	58°50	63°84	67°40	66°96
7 th		65°48	60°14	54°98	50°54	48°28	48°60	53°58	63°92	60°26	61°54	72°02	62°88
8 th		65°22	58°16	55°76	50°84	48°22	47°86	53°38	60°04	60°34	61°22	72°48	64°60
9 th		67°50	56°80	55°60	50°42	49°26	50°44	53°62	55°34	61°40	61°40	71°46	62°10
10 th		66°76	58°70	56°22	50°56	49°78	50°38	53°48	54°42	61°02	64°34	69°12	63°64
11 th		67°60	60°58	56°30	52°34	48°34	47°30	53°20	54°48	58°26	62°38	67°02	65°84
12 th		68°22	56°38	56°38	52°12	47°38	49°84	52°30	54°84	58°16	61°78	63°40	65°12
13 th		68°94	55°14	55°48	50°42	45°66	49°56	52°90	59°60	63°58	64°26	67°98	66°24
14		67°90	55°84	56°14	48°96	47°06	46°88	50°64	60°58	60°78	66°16	71°16	68°54
15 th		65°98	61°46	54°12	44°96	46°44	47°20	49°34	61°16	58°40	65°16	69°52	65°86
16 th		67°78	56°90	53°70	45°40	48°66	48°86	51°62	59°86	62°90	64°82	65°24	64°02
17 th		62°82	54°70	52°44	47°90	48°62	48°96	51°98	54°00	66°44	62°54	66°54	64°62
18 th		60°80	55°32	50°22	49°02	47°98	50°78	52°22	56°06	63°98	64°78	64°40	63°60
19 th		63°62	56°64	53°28	51°10	46°02	51°76	52°82	55°48	64°16	66°02	64°94	65°20
20 th		66°50	57°20	52°94	50°54	45°08	51°92	53°00	55°92	64°36	65°80	66°46	66°26
21 st		63°88	57°68	51°56	51°28	47°68	53°92	52°28	58°52	68°86	61°38	72°30	62°82
22 ^d		62°30	55°66	52°82	50°36	47°70	54°80	53°32	55°08	71°26	62°56	72°76	64°06
23 ^d		62°62	54°60	53°20	48°10	47°32	53°74	52°14	57°84	68°58	65°50	66°40	67°90
24 th		63°00	56°08	50°30	48°14	45°78	53°62	53°38	60°16	62°72	62°60	67°92	66°52
25 th		65°16	55°38	48°92	49°44	48°48	52°06	55°48	59°56	60°94	64°84	67°74	65°40
26 th		61°66	56°98	50°52	47°86	48°64	52°18	55°00	59°68	61°56	68°38	66°30	66°26
27 th		61°24	58°62	50°58	48°68	48°66	54°02	55°92	60°38	61°34	65°08	66°76	64°16
28 th		62°02	58°22	51°36	48°48	48°50	53°50	55°96	58°44	60°70	64°90	68°28	65°84
29 th		61°68	59°72	51°34	47°08	45°96	49°94	54°26	57°48	62°18	64°36	65°46	
30 th		62°38	59°38	48°92	47°76	47°58	47°52	54°54	59°10	62°02	68°38	63°74	
31 st		61°04		49°90		46°74	49°74		59°84		72°16	66°40	
MEANS.	observed	64·85	58·42	53·38	49·21	47·68	50·04	53·37	57·80	61·72	64·51	67·87	65·58
	calculated	63·851	58·914	53·254	49·009	47·859	49·812	53·509	57·636	61·605	64·959	66·919	66·662
	calc. — observ.	—1·00	+0·49	—0·13	—0·20	+0·18	—0·23	+0·14	—0·16	—0·12	+0·45	—0·95	+1·08
MEANS FOR THE QUARTERS.		58·888			48·976			57·633			66·001		

The monthly mean values of this table formed the base by the aid of which the annual curve according to Bessel's interpolation formula was computed.

The series expressing the annual march of temperature is as follows, if we start with the 1st of January:

$$T^{(n)} = 57.832 + 9.486 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 41^\circ 31' \right\} + 0.849 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 238^\circ 32' \right\} + 0.088 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 0^\circ 46' \right\} + \dots;$$

By this formula the monthly means have been determined, and the results are to be found in the above table; the differences between the calculated and observed values, inserted beneath both, show how closely the formula corresponds with actual observations, the mean error amounting to ± 0.427 only.

An inquiry into the roots of the differential equation, in the manner delineated in the introductory remarks, with a view to determine the time of occurrence of the extremes results thus:

Maximum 29th 5 of January... Minimum 12th 5 of July; the above table on the other hand shows the maximum on the 22^d of January and the minimum on the 20th of July.*

The absolute extremes during the whole period of observation were registered on the 14th 6 of January 1862 and the 14th 2 of July 1860, the temperature amounting on the first occasion to 111.2 and on the second 29.0; it is but consistent with the nature of thermic oscillations, that the times of occurrence of the absolute extremes for single years only show occasionally great irregularities, though by far less so than we have observed to be the case, when speaking of the annual extremes in atmospheric pressure. For special information on this subject we shall have to refer to the previous publications, issued by the observatory.

Now, after having established the formula, expressive of the march of temperature throughout the year, we may illustrate the distribution of heat still further by subjoining the five day means. In the respective table the values given represent the mean values for each period during the five years of observation, consequently the mean temperature for 25 single days. The figures inserted in the heading, underneath the months, indicate the limiting days for the first period in each month.

Mean „Five day Means“ in Temperature of air for the years 1858 to 1863.

Number of the Period in the resp. Months.	Jan. (1—5)	Febr. (31—4)	March (2—6)	April (1—5)	May (1—5)	June (31—4)	July (5—9)	Aug. (4—8)	Sept. (3—7)	Oct. (3—7)	Nov. (2—6)	Dec. (2—6)
1.	68.14	67.60	66.04	63.08	55.32	49.56	48.92	48.34	54.08	58.02	57.60	64.56
2.	70.48	64.56	66.50	58.94	55.54	49.62	47.64	49.52	53.20	55.82	60.26	62.18
3.	67.84	65.88	67.76	57.88	55.70	50.88	47.54	48.52	51.30	59.04	60.72	64.44
4.	65.50	64.66	63.52	56.14	52.52	47.66	46.72	53.24	52.72	56.20	65.60	64.10
5.	69.44	65.52	62.92	56.12	51.38	49.68	48.10	53.08	54.38	59.54	65.00	64.78
6.	66.08	64.94	61.68	58.58	50.54	48.32	46.98	51.04	55.74	58.86	62.40	66.96
						47.04						

* If we disregard the fact, that the mean for the 15th of June is still less by 0.12, this being evidently an accidental irregularity.

From what we above stated it is clear that the intrinsic weight of the figures in this table is nearly equivalent to that which may be attached to the mean value of a single month, as the number of days constituting the periods in question is nearly alike in both cases (25 and 30); but as the differences which may occur between the five mean values for every month amount on an average to $2^{\circ}96$, we may conclude that the above figures come near the actual value to within half of that number of degrees, or $1^{\circ}48$ (more correctly $1^{\circ}78$). Such reflections will materially assist in arriving at a correct opinion on the reliability of the maximum and minimum penthemeral periods, being respectively $70^{\circ}48$ in the 2^d period of January (6th and 10th) and $46^{\circ}72$ in the 4th period of July (20th and 24th).

17. The subjoined tables, illustrating the distribution of heat throughout the year, will be found exceedingly useful; suffice it to remark for the better understanding that table 1 and 2 show the number of days during 5 years, while table 3 gives the mean number of days during one year. This must not be lost sight of when examining the facts contained therein, as otherwise we should be led to erroneous conclusions. To make the various tables at once comparable it would have been necessary to divide the number of days of the first two tables by 5, but in order to avoid fractions of days it was in these two cases not thought convenient to do so.

1. Highest Temperatures.

MONTHS 1858—1863	100° and above		Between					
			100° and 90°		90° and 80°		80° and 75°	
	Number in 5 Years	Mean Tempe- rature	Number in 5 Years	Mean Reading	Number in 5 Years	Mean Reading	Number in 5 Years	Mean Reading
March . . .	0	—	14	92·8	35	84·8	16	77·6
April . . .	0	—	0	—	7	84·4	13	77·1
September . . .	0	—	0	—	0	—	3	75·9
October . . .	0	—	0	—	18	82·9	11	77·6
November . . .	1	103·2	10	94·3	20	84·4	19	77·6
December . . .	4	102·6	12	92·6	26	85·3	29	77·5
January . . .	5	108·1	33	94·3	21	83·5	22	77·5
February . . .	3	103·9	10	93·5	22	82·9	25	77·5

2. Lowest Temperatures.

MONTHS	Below 32°		Between 32° and 40°	
	Number in 5 Years	Mean Reading	Number in 5 Years	Mean Reading
April . . .	0	—	10·2	39·8
May . . .	0	—	7	38·1
June . . .	0	—	35	36·5
July . . .	6	30·7	43	37·0
August . . .	1	31·5	37	37·2
September . . .	0	—	16	36·8
October . . .	0	—	13	33·7
November . . .	0	—	1	39·5

3. Mean Temperatures.

MONTHS 1858—1863	Mean Number of days the Mean Temperature of air was between				
	30° and 40°	40° and 50°	50° and 60°	60° and 70°	70° and above
March . . .	0	0	6·6	18·8	5·6
April . . .	0	0·4	20·6	8·2	0·8
May . . .	0	7·0	22·4	1·6	0
June . . .	0	16·0	14·0	0	0
July . . .	0·8	21·4	8·8	0	0
August . . .	0	18·0	12·4	0·6	0
September . . .	0	7·0	20·2	2·8	0
October . . .	0	1·4	20·8	7·6	1·2
November . . .	0	0·2	13·8	12·8	3·2
December . . .	0	0	6·2	19·8	5·0
January . . .	0	0	2·2	18·4	10·4
February . . .	0	0	3·4	19·8	5·0
Year . . .	0·8	71·4	151·4	110·4	31·2

18. The little table in this paragraph gives an idea of the daily and monthly range to which the temperature of air is subjected. The mean daily range is the difference between the mean of all the daily maxima and the mean of all the daily minima for a certain month, quarter or year. Analogously with this are to be understood the mean monthly ranges. The mean of the five yearly maxima minus the mean of the five yearly minima is to be taken for the mean yearly range.

1858—63.	MEAN RANGE		1858—63.	MEAN RANGE	
	daily.	monthly.		daily.	monthly.
March . . .	20°39	48°34	June . . .	12°70	28°58
April . . .	17°18	41°92	July . . .	12°78	26°62
May . . .	13°63	32°12	August . . .	15°28	33°28
Autumn . .	17°068	40°793	Winter . .	13°589	29°493
September .	17°79	41°38	December .	21°94	50°62
October . .	19°56	46°02	January . .	22°10	54°70
November .	21°74	51°86	February .	19°59	51°20
Spring . .	19°693	46°420	Summer . .	21°210	52°173
Year . . .	17°890	42°220	M. Yearly R.	74°088	
		R. during the entire Period of obs. 82°20		$\left. \begin{array}{l} \text{Min. } \frac{14.2}{\text{VII}} 60 \\ \text{Max. } \frac{14.6}{\text{I}} 62 \end{array} \right\}$	

The extremes, in daily as well as in monthly range, coincide with the extremes in temperature. Near the tropical times the change in the mean daily range becomes very small, which cannot be said of the mean monthly ranges; it is however evident, that the latter do not bear the same weight with regard to reliability as the former which have been derived from a 30 times greater number of observations, and are therefore less apt to exhibit accidental irregularities.

19. Diurnal fluctuation in Temperature of air. The hourly variation tables for temperature of air have already been partly published (R. I. page 56) and are partly to be found in appendix 11 of this volume. The values contained in these various documents have been combined in order to receive mean values for the whole period of observation which form the object of the subjoined table. Of the values for every month and hour means have again been taken, thus establishing the mean diurnal fluctuation for the year inserted in the last column. The general mean adopted when speaking of the annual march of temperature viz: 57°832 differs slightly from the mean of this last column which was determined to be 57°895. This discrepancy is easily accounted for by the fact, that the missing observations are differently distributed in both instances, influencing thereby the final results in a different manner.

HOUR	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Feb.	Year.
Midnight	60°00	54°65	50°82	46°63	45°11	47°17	49°45	52°42	55°66	58°08	61°99	60°17	53°513
1h AM	59°33	53°96	50°39	46°35	44°66	46°70	48°81	51°63	54°92	57°29	61°26	59°73	52°923
2	58°79	53°51	49°94	45°99	44°41	46°28	48°28	51°34	54°41	56°65	60°63	59°14	52°448
3	58°22	53°06	49°57	45°69	43°95	45°97	47°80	50°93	53°87	56°16	60°03	58°61	51°988
4	57°61	52°66	49°43	45°37	43°73	45°68	47°36	50°65	53°45	55°77	59°51	58°32	51°628
5	57°39	52°40	49°40	45°23	43°56	45°40	47°10	50°51	53°66	56°13	59°49	57°93	51°517
6	57°09	52°23	49°22	45°15	43°38	45°19	46°91	51°50	55°84	58°40	61°27	58°47	52°054
7	59°07	52°80	49°29	45°05	43°28	45°54	48°93	54°74	59°62	62°07	64°47	61°16	53°835
8	62°31	55°33	50°78	45°97	44°17	47°29	52°15	57°81	62°66	65°42	67°70	64°53	56°343
9	65°97	58°82	53°42	48°13	46°34	50°33	55°33	60°50	65°09	68°24	70°71	67°76	59°220
10	69°01	61°93	56°14	50°78	49°19	53°15	57°89	62°97	67°37	70°26	73°25	70°23	61°848
11	71°14	64°18	58°10	53°12	51°39	55°18	59°59	64°50	69°25	72°00	74°96	72°28	63°808
Noon	72°64	65°39	59°16	54°73	52°72	56°34	60°74	65°46	70°43	73°00	76°07	73°20	64°990
1h PM	73°92	66°38	59°79	55°43	53°26	57°35	61°37	65°84	70°61	73°68	76°33	74°48	65°703
2	74°32	66°38	59°80	55°68	53°70	57°41	61°35	65°70	70°55	74°02	76°77	74°34	65°835
3	73°41	66°00	58°93	55°11	53°00	56°76	60°90	65°13	69°73	73°21	76°43	73°88	65°208
4	72°27	64°83	57°62	53°70	51°76	55°47	59°73	63°89	68°55	72°18	75°11	72°91	64°002
5	70°30	62°68	55°50	51°68	49°66	53°31	57°84	62°29	66°96	70°52	73°60	71°44	62°148
6	67°69	60°49	54°26	50°58	48°32	51°45	55°35	59°83	64°56	67°92	71°65	68°78	60°073
7	65°67	59°10	53°38	49°75	47°78	50°44	53°95	57°71	61°63	65°07	68°58	66°02	58°257
8	63°97	57°88	52°74	49°03	47°22	49°66	53°01	56°45	60°00	62°73	66°38	64°48	56°963
9	62°67	56°86	51°99	48°43	46°56	48°92	52°07	55°34	58°73	61°37	65°18	62°93	55°921
10	61°65	55°95	51°40	47°69	46°16	48°25	51°21	54°37	57°64	60°30	63°95	62°02	55°049
11	60°74	55°26	50°97	47°15	45°74	47°68	50°34	53°37	56°56	59°18	62°69	61°04	54°227

An application of Bessel's interpolation formula upon the above values yields the following series expressing the diurnal fluctuation in temperature of air for every month and the year:

$$\begin{aligned}
 \text{March} \quad . \quad T^{(n)} &= 64.799 + 8.044 \sin(n15^\circ + 53^\circ 42') + 2.077 \sin(n30^\circ + 65^\circ 21') \\
 &\quad + 0.045 \sin(n45^\circ + 205^\circ 22') + \dots \\
 \text{April} \quad . \quad &= 58.447 + 6.727 \sin(n15^\circ + 52^\circ 31') + 2.040 \sin(n30^\circ + 63^\circ 38') \\
 &\quad + 0.337 \sin(n45^\circ + 134^\circ 54') + \dots \\
 \text{May} \quad . \quad &= 53.418 + 4.842 \sin(n15^\circ + 56^\circ 4') + 1.851 \sin(n30^\circ + 64^\circ 3') \\
 &\quad + 0.396 \sin(n45^\circ + 88^\circ 55') + \dots \\
 \text{June} \quad . \quad &= 49.268 + 4.840 \sin(n15^\circ + 50^\circ 23') + 1.792 \sin(n30^\circ + 54^\circ 57') \\
 &\quad + 0.520 \sin(n45^\circ + 67^\circ 47') + \dots \\
 \text{July} \quad . \quad &= 47.460 + 4.515 \sin(n15^\circ + 49^\circ 28') + 1.814 \sin(n30^\circ + 58^\circ 34') \\
 &\quad + 0.489 \sin(n45^\circ + 65^\circ 8') + \dots \\
 \text{August} \quad . \quad &= 50.288 + 5.566 \sin(n15^\circ + 53^\circ 31') + 1.973 \sin(n30^\circ + 62^\circ 9') \\
 &\quad + 0.340 \sin(n45^\circ + 93^\circ 26') + \dots \\
 \text{September} \quad . \quad &= 53.644 + 6.866 \sin(n15^\circ + 55^\circ 57') + 1.857 \sin(n30^\circ + 78^\circ 8') \\
 &\quad + 0.327 \sin(n45^\circ + 186^\circ 0') + \dots \\
 \text{October} \quad . \quad &= 57.705 + 7.612 \sin(n15^\circ + 61^\circ 58') + 1.516 \sin(n30^\circ + 89^\circ 22') \\
 &\quad + 0.478 \sin(n45^\circ + 218^\circ 51') + \dots \\
 \text{November} \quad . \quad &= 61.740 + 8.541 \sin(n15^\circ + 63^\circ 58') + 1.382 \sin(n30^\circ + 94^\circ 26') \\
 &\quad + 0.657 \sin(n45^\circ + 237^\circ 0') + \dots
 \end{aligned}$$

$$\begin{aligned}
\text{December . } T^{(n)} &= 64.569 + 9.036 \sin(n15^\circ + 62^\circ 32') + 1.215 \sin(n30^\circ + 92^\circ 38') \\
&\quad + 0.807 \sin(n45^\circ + 241^\circ 8') + \dots \\
\text{January . } &= 67.834 + 8.604 \sin(n15^\circ + 59^\circ 38') + 1.584 \sin(n30^\circ + 86^\circ 23') \\
&\quad + 0.758 \sin(n45^\circ + 222^\circ 1') + \dots \\
\text{February . } &= 65.577 + 8.122 \sin(n15^\circ + 57^\circ 28') + 1.619 \sin(n30^\circ + 70^\circ 59') \\
&\quad + 0.613 \sin(n45^\circ + 208^\circ 56') + \dots \\
\text{Year . . } &= 57.895 + 6.912 \sin(n15^\circ + 57^\circ 11') + 1.664 \sin(n30^\circ + 71^\circ 30') \\
&\quad + 0.237 \sin(n45^\circ + 190^\circ 55') + \dots
\end{aligned}$$

In a manner similar to that explained, when speaking about the diurnal fluctuation in force of wind, the extensive labour of calculating the values of temperature for every hour in the various months and the year was carried out with the greatest possible care. A comparison of the observed and calculated values gave a highly satisfactory result. The differences are all through very small and the signs changing, so as to convince us of the reliability of the established formulae. The subjoined table contains the evidence requisite to form an opinion on this subject; it remains only to mention that the observed values were subtracted from the calculated ones in order to receive the signs below.

HOUR	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year
Midnight	+ 0.23	+ 0.06	+ 0.24	- 0.10	+ 0.03	+ 0.04	+ 0.35	+ 0.38	+ 0.34	+ 0.39	+ 0.51	+ 0.39	+ 0.196
1 ^h AM	+ 0.09	+ 0.30	+ 0.01	- 0.17	+ 0.08	+ 0.15	+ 0.35	+ 0.40	+ 0.22	+ 0.26	+ 0.45	+ 0.29	+ 0.219
2	- 0.26	+ 0.21	+ 0.17	- 0.07	- 0.01	+ 0.17	+ 0.08	- 0.11	- 0.23	- 0.16	+ 0.04	+ 0.09	+ 0.022
3	- 0.48	- 0.03	+ 0.18	- 0.01	+ 0.13	- 0.01	- 0.31	- 0.44	- 0.46	- 0.49	- 0.38	+ 0.16	- 0.190
4	- 0.39	- 0.31	- 0.09	0.00	- 0.04	- 0.22	- 0.50	- 0.45	- 0.12	- 0.18	- 0.37	- 0.56	- 0.259
5	- 0.11	- 0.41	- 0.38	- 0.19	- 0.23	- 0.28	- 0.28	+ 0.22	+ 0.58	+ 0.48	+ 0.14	+ 0.01	- 0.043
6	+ 1.02	+ 0.06	- 0.15	- 0.24	- 0.19	+ 0.03	+ 0.74	+ 0.73	+ 0.41	+ 0.40	+ 0.07	+ 0.67	+ 0.284
7	+ 0.72	+ 0.70	+ 0.44	+ 0.21	+ 0.25	+ 0.49	+ 0.50	- 0.13	- 0.51	- 0.25	- 0.37	- 0.21	+ 0.181
8	- 0.06	+ 0.30	+ 0.38	+ 0.39	+ 0.43	+ 0.36	- 0.20	- 0.32	- 0.38	- 0.30	- 0.29	- 0.23	+ 0.011
9	- 0.78	- 0.42	- 0.17	+ 0.08	+ 0.06	- 0.37	- 0.52	- 0.12	+ 0.18	- 0.11	- 0.05	- 0.37	- 0.198
10	- 0.75	- 0.53	- 0.47	- 0.18	- 0.49	- 0.55	- 0.34	- 0.13	+ 0.28	+ 0.21	+ 0.10	- 0.05	- 0.230
11	- 0.09	- 0.16	- 0.19	- 0.09	- 0.33	- 0.12	+ 0.14	+ 0.11	+ 0.04	+ 0.10	+ 0.28	+ 0.43	- 0.036
Noon	+ 0.51	+ 0.47	+ 0.34	+ 0.22	+ 0.16	+ 0.51	+ 0.38	+ 0.18	- 0.19	0.00	+ 0.26	+ 0.46	+ 0.247
1 ^h PM	+ 0.40	+ 0.34	+ 0.35	+ 0.51	+ 0.54	+ 0.32	+ 0.27	+ 0.12	+ 0.01	- 0.05	+ 0.46	- 0.16	+ 0.207
2	+ 0.13	+ 0.20	- 0.01	+ 0.18	0.00	+ 0.06	+ 0.05	+ 0.01	- 0.05	- 0.25	- 0.02	+ 0.03	- 0.023
3	+ 0.19	- 0.31	- 0.22	- 0.19	- 0.26	- 0.30	- 0.35	- 0.18	+ 0.12	+ 0.14	- 0.21	- 0.43	- 0.160
4	- 0.27	- 0.54	- 0.38	- 0.21	- 0.43	- 0.49	- 0.47	- 0.17	+ 0.04	+ 0.07	+ 0.01	- 0.13	- 0.245
5	- 0.38	- 0.03	+ 0.24	+ 0.30	+ 0.19	+ 0.05	- 0.14	- 0.22	- 0.22	- 0.15	- 0.21	- 0.34	- 0.038
6	+ 0.02	+ 0.46	+ 0.19	+ 0.11	+ 0.31	+ 0.43	+ 0.64	+ 0.30	- 0.09	0.00	- 0.48	+ 0.18	+ 0.223
7	0.00	+ 0.22	+ 0.03	- 0.05	- 0.01	+ 0.17	+ 0.38	+ 0.44	+ 0.46	+ 0.21	+ 0.15	+ 1.01	+ 0.255
8	0.00	- 0.01	- 0.12	+ 0.31	- 0.08	- 0.07	- 0.16	- 0.38	0.00	+ 0.17	+ 0.12	- 0.06	- 0.019
9	0.00	- 0.18	- 0.02	- 0.16	+ 0.06	- 0.14	- 0.36	- 0.36	- 0.30	- 0.24	- 0.38	- 0.22	- 0.209
10	+ 0.07	- 0.19	+ 0.03	- 0.07	- 0.04	- 0.13	- 0.32	- 0.33	- 0.25	- 0.33	- 0.22	- 0.42	- 0.213
11	+ 0.21	- 0.12	+ 0.04	- 0.12	- 0.14	- 0.06	- 0.03	+ 0.02	+ 0.13	+ 0.02	+ 0.38	- 0.47	- 0.003

The determination of the time and value of the extremes in diurnal fluctuation of temperature of air was a task next to be executed. The little table annexed shows the tropical hours and their corresponding temperatures.

MONTHS.	MAXIMUM.		MINIMUM.		MONTHS.	MAXIMUM.		MINIMUM.	
	Time p. m.	Tempera- ture.	Time a. m.	Tempera- ture.		Time p. m.	Tempera- ture.	Time a. m.	Tempera- ture.
	h. m.	°	h. m.	°		h. m.	°	h. m.	°
March .	1 37	74.521	4 26	57.079	September	1 10	61.655	4 32	46.696
April .	1 21	66.758	5 7	51.977	October	1 2	65.967	3 55	50.202
May .	1 7	60.137	5 26	48.973	November	1 15	70.637	3 37	53.255
June .	1 25	56.028	5 49	44.868	December	1 46	73.767	3 36	55.463
July .	1 23	53.884	5 53	43.180	January	1 25	76.833	4 4	59.141
August	1 17	57.707	5 20	45.079	February	1 36	74.424	4 20	57.720
Year .	1 22	66.113	4 21	51.332					

It is elicited from the above, that the time the maximum occurs is subjected to slight oscillations, showing its greatest and least retardation after the sun's culmination in December and October respectively; and moreover that the minimum occurs in July latest and in December earliest in the morning, exhibiting between these two points a somewhat regular increase and decrease. Whether there exists no periodicity at all in the occurrence of the maximum throughout the year or whether the irregularities in the above series, bearing on this question, are to be accounted for by the shortness of the period over which the observations extend, or whether other influences cause these irregularities, is rather premature to say. These questions can only be satisfactorily answered by a rigid comparison of the diurnal motion of temperature of air and that of other meteorological elements, with a long series of observation at command.

It is a matter of considerable interest to enter upon an inquiry of the daily amplitude for every month of the year. We have already had an opportunity to speak of the mean range in temperature of air; the conclusions resulting from the above formulae are in the main points the same. In summer the amplitude reaches its maximum, while in the winter season it attains its minimum value. Beginning with March and ending with February the series is as follows: 17.692, 14.781, 11.164, 11.160, 10.704, 12.628, 14.959, 15.765, 17.382, 18.304, 17.692 and 16.704. The mean annual amplitude amounts to 14.781. It is evident that these values cannot be identical with the mean daily ranges just referred to, but the great conformity between these two sets of values becomes apparent at first sight.

20. Thermic windrose. The means of temperature of air for every point of the compass and every month, during five years of observation, were taken in a manner analogous to that explained when treating on the barometric windrose. The tables relating to this subject have already been partly printed (R. I. pag. 65), and were partly embodied in appendix 12. The methods applied in reducing the values for 32 points to such for sixteen only, and again from months to quarters, have already been detailed in the introduction of this volume, and do not call for any further remark to cause the subjoined tables forthwith to be understood.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	Septbr.	Octbr.	Novbr.	Decbr.	Jan.	Febr.
S.	66.88	61.27	56.08	50.48	48.50	51.26	52.36	57.89	62.81	67.02	67.53	67.80
S.S.E.	62.70	59.13	54.81	49.00	46.67	50.34	52.87	54.31	60.56	62.95	64.40	64.28
S.E.	59.01	56.69	54.14	48.75	48.23	49.69	52.21	53.57	57.83	60.20	64.31	62.68
E.S.E.	60.61	57.07	53.41	47.68	47.05	46.80	52.75	53.15	58.70	59.10	65.64	62.15
E.	64.70	58.83	52.76	49.31	44.66	48.89	50.85	56.00	61.04	63.39	68.02	62.17
E.N.E.	64.39	57.46	52.86	45.51	45.71	48.46	49.61	58.02	59.41	64.84	70.11	65.33
N.E.	64.13	54.57	51.56	45.53	43.32	47.67	51.74	58.92	62.62	65.01	69.57	66.77
N.N.E.	71.15	60.81	54.22	49.65	48.77	51.46	56.58	64.58	68.27	70.89	75.63	72.25
N.	73.96	62.80	55.23	51.39	49.43	53.11	57.97	65.12	72.30	74.01	80.92	74.93
N.N.W.	67.85	59.98	53.78	50.29	48.55	51.45	54.58	58.48	68.18	69.77	77.81	69.89
N.W.	63.55	56.54	51.92	48.41	46.76	48.82	51.55	54.24	59.72	61.58	66.14	65.80
W.N.W.	62.84	55.77	51.16	48.17	47.45	48.37	52.01	54.42	59.71	60.84	65.34	61.55
W.	60.64	55.76	52.84	49.72	48.46	48.86	50.67	54.69	56.44	59.59	60.86	60.01
W.S.W.	61.88	56.97	53.43	50.40	48.44	49.40	50.97	55.47	58.25	60.19	63.24	62.12
S.W.	64.11	59.59	54.27	51.58	49.16	50.72	52.42	56.48	60.83	63.27	66.06	65.68
S.S.W.	67.36	61.15	55.21	51.47	50.00	51.32	54.39	58.20	62.30	67.25	68.51	68.32
u =	64.7662	58.3993	53.6050	49.2087	47.5725	49.7887	52.7206	57.0962	61.8106	64.3687	68.3806	65.7331

The values »u« represent the means of the various columns, and the same arguments, advanced to illustrate the special character of this quantity u with regard to atmospheric pressure, holds good in the present instance, and we may therefore be allowed to refer to our previous explanations.

Under this supposition u — m results throughout the year as follows:

March: — 0.084 (S.S.W.); April: — 0.021 (N.W. by W.); May: + 0.225 (N. N.W.); June: — 0.001 (N. by E.); July: — 0.107 (N. $\frac{1}{2}$ W.); August: — 0.251 (N. N.W.); September: — 0.649 (N. N. W.); October: — 0.704 (W. by N.); November: + 0.091 (S.W. by S.); December: — 0.141 (S.S.W.); January: + 0.511 (S. S. W.); February: + 0.153 (S. by W.); year: — 0.082 (N. W. $\frac{1}{2}$ W.).

The influence of the mean direction of the wind on the thermometer is clearly illustrated by this series, for we notice that, in those months during which northerly winds prevail, the thermometer is too high, while during months with southerly breezes prevailing it is too low. Rather remarkable exceptions of this rule form the months of May and December, when the reverse takes place of what one would be led to expect. What the cause of this may be is difficult to say, but we feel inclined to believe that it is merely accidental, as similar irregularities are not observable in pressure of air.

What is just roughly indicated by these facts, will meet with a strict inquiry in the table below and the conclusions based thereon.

DIREC- TION OF WIND.	Derived from observations during the years 1858—63.														
	AUTUMN.			WINTER.			SPRING.			SUMMER.			YEAR.		
	calculated.	observed.	calculated minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.
S.	60.37	61.22	—0.85	49.60	50.10	—0.50	58.16	57.89	+0.27	67.34	67.49	—0.15	58.656	59.135	—0.479
S.S.E.	58.98	58.28	+0.70	48.73	48.72	+0.01	56.78	55.75	+1.03	65.60	63.79	+1.81	57.405	56.284	+1.121
S.E.	57.18	55.43	+1.75	47.50	48.94	—1.44	54.88	54.21	+0.67	63.02	62.46	+0.56	55.672	54.790	+0.882
E.S.E.	56.03	56.16	—0.13	46.56	47.22	—0.66	53.80	54.66	—0.86	61.56	62.30	—0.74	54.568	54.708	—0.140
E.	56.25	58.80	—2.55	46.43	47.58	—1.15	54.46	56.17	—1.71	62.66	64.76	—2.10	54.891	56.826	—1.935
E.N.E.	57.77	58.26	—0.49	47.26	46.35	+0.91	56.76	55.71	+1.05	66.27	66.82	—0.55	56.638	56.627	+0.011
N.E.	59.77	56.64	+3.13	48.76	45.56	+3.20	59.66	57.48	+2.18	70.81	67.12	+3.69	58.973	56.158	+2.815
N.N.E.	61.15	61.26	—0.11	49.98	49.97	+0.01	61.69	62.75	—0.86	74.01	73.64	+0.37	60.693	60.836	—0.143
N.	61.17	62.77	—1.60	50.62	51.24	—0.62	61.78	64.48	—2.70	74.18	76.81	—2.63	60.906	62.644	—1.738
N.N.W.	59.86	60.14	—0.28	50.37	50.07	+0.30	59.90	59.67	+0.23	71.16	72.42	—1.26	59.535	59.973	—0.438
N.W.	58.00	57.34	+0.66	49.52	46.71	+2.81	57.04	55.21	+1.83	66.44	64.24	+2.20	57.356	56.171	+1.185
W.N.W.	56.67	56.58	+0.09	48.64	48.04	+0.60	54.66	55.50	—0.84	62.34	62.64	—0.30	55.550	55.780	—0.230
W.	56.61	56.70	—0.09	48.27	48.93	—0.66	53.88	54.03	—0.15	60.66	60.16	+0.50	55.023	55.328	—0.305
W.S.W.	57.79	57.49	+0.30	48.56	49.25	—0.69	54.84	54.89	—0.05	61.81	61.82	—0.01	55.898	55.739	+0.159
S.W.	59.45	59.11	+0.34	49.24	50.19	—0.95	56.70	56.58	+0.12	64.57	65.00	—0.43	57.475	57.475	0.000
S.S.W.	60.55	61.38	—0.83	49.74	50.84	—1.10	58.13	58.21	—0.08	66.93	67.95	—1.02	58.665	59.437	—0.772
u=		58.60			48.73			57.07			66.21			57.369	

By the aid of the above values for u we recognise the influence of the mean direction of wind on the thermometer still better than we have done, when considering the monthly values for u . The difference $u - m$ is as follows:

Autumn: -0.29 (N.W. $\frac{1}{2}$ N.); Winter: -0.25 (N. by W.); Spring: -0.56 (W.N.W. $\frac{1}{2}$ W.); Summer: $+0.21$ (S.S.W.); the Year: -0.46 (N.W. $\frac{1}{2}$ W.). In close correspondence with the results, obtained by an examination of the influence of the wind's mean direction on the barometer, we find now that the same influence causes the thermometer to be too high by 0.46 on an average.

Bessel's formula gives, based upon the above values, the following interpolation series for the various seasons, expressing the dependancy of the reading of the thermometer on the wind's direction:

$$\text{Autumn } T^{(m)} = 58.60 + 0.440 \sin (m 22^\circ 30' + 246^\circ 0') + 2.394 \sin (m 45^\circ 0' + 114^\circ 58') + \dots$$

$$\text{Winter} = 48.73 + 1.050 \sin (m 22^\circ 30' + 208^\circ 56') + 1.397 \sin (m 45^\circ 0' + 99^\circ 3') + \dots$$

$$\text{Spring} = 57.07 + 1.832 \sin (m 22^\circ 30' + 278^\circ 59') + 3.105 \sin (m 45^\circ 0' + 110^\circ 57') + \dots$$

$$\text{Summer} = 66.21 + 3.562 \sin (m 22^\circ 30' + 286^\circ 16') + 4.785 \sin (m 45^\circ 0' + 108^\circ 1') + \dots$$

$$\text{Year} = 57.369 + 1.127 \sin (m 22^\circ 30' + 266^\circ 39') + 2.559 \sin (m 45^\circ 0' + 109^\circ 31') + \dots$$

By these formulae we computed the value of temperature of air for the various points of the compass in each quarter, and inserted the same in the above table along with the differences between the calculated and observed temperature.

From this we glean that the mean error amounts in autumn to ± 0.867 , in winter to ± 0.976 , in spring to ± 0.914 , in summer to ± 1.014 and for the whole year to ± 0.772 , which adduces ample evidence as to the reliability of the observations and the method of discussion applied.

A determination of the turning points in the thermic windrose and the corresponding extreme values resulted the subjoined table, giving also those points of the compass in which the temperature of air is equal to the mean value. The method of discussion having been explained already, there can be no reason for adding any further remarks.

PERIOD.	MAXIMUM.		MINIMUM.		MEAN.			
	position.	value.	position.	value.	positions.			
Autumn . .	S. 169° 3' E.	61°35'	S. 75°28' E.	55°93'	S. 27°15' E., S. 121°48' E., S. 217°40' E., 301°48'			
Winter . .	184°35'	50°64'	81°54'	46°36'	22°29'	136° 5'	244°47'	298°34'
Spring . .	169°41'	62°01'	70°59'	53°78'	18°46'	114°44'	224°45'	319°38'
Summer . .	169°51'	74°53'	271°23'	60°66'	16°51'	112°21'	226° 6'	329° 1'
Year . . .	171°32'	61°028'	74°15'	54°497'	23° 0'	119°38'	224°52'	313°28'

These results indicate that there exist considerable local influences which cause irregularities apt to conceal, to some degree, the original law. We rightly conclude at once that, in as much as there are four points of a temperature equal to the mean, there must also be two maxima and two minima within the windrose. This alone sufficiently proves the effect local influences exert upon the thermometer in the present instance; and indeed it is only the windrose for winter which at all approaches to what we should be induced to expect, while spring and summer deviate greatly from the law. Foremost among the disturbing causes stands that immense triangular sheet of water between Wilson's Promontory, Cape Otway and Melbourne, including Port Phillip Bay, which raises at all seasons of the year the temperature of Southerly breezes, thereby causing a secondary maximum. The main axis of the curve, representing the oscillations of the thermometer within the windrose, runs for that reason, and because the primary and secondary maximum are diametrically opposite each other, parallel to the main axis of the sheet of water above referred to. Summer and spring exhibit this influence in the highest degree, while in winter it becomes almost imperceptible. Notwithstanding all that we recognize in each season the general law, as dictated by the action of two alternating currents of air, if we but attach due weight to each disturbing cause. The position of the primary maximum of the thermic windrose is subjected to very slight undulations throughout the year, keeping between N. $\frac{1}{2}$ W. and N. by E. In order to explain this deviation from the hottest point of the compass, indicated by theory, we have to direct our attention towards the extensive plains between the rivers Murray and Darling. During winter, when the effect of the heated plains becomes less perceptible, the point of maximum heat moves farthest towards West. Then again: the indentation of the curve in west is certainly due to the peninsular shape of that portion of the Australian continent between Spencer Gulf and Cape Howe; westerly winds blow for a short distance only over land, bringing us the cool air from the vast area of the southern Indian ocean. In winter this influence vanishes, the temperature of land and sea being then nearly alike. The depression of the thermometer towards East is, as we know, more in accordance with theory, although the position of the coldest point near East, instead of near S.E., clearly indicates the influence of the mountainous country towards E.N.E. of Melbourne.

Suffice it to have adduced a few of the causes which tend to interfere with the full and distinct development of the thermic windrose at Port Phillip.

It remains yet to add a few words on the range of temperature within the windrose. In summer this range assumes its maximum value of $13^{\circ}87$, and in winter its minimum of $4^{\circ}28$, the equinoctial quarters autumn and spring being respectively $5^{\circ}42$ and $8^{\circ}23$, while the average for the year amounts to $6^{\circ}531$.

21. Temperature of air during calms. The total number of observations on temperature of air during calms amounts to 1484. In the following little table we find the mean temperature during calms for the several months and quarters, and for the year. Close to these temperatures are inserted the corresponding differences between them and the general mean temperatures for the periods in question. It is scarcely necessary to mention that the results for the quarters do not represent the simple means of the constituting months, but have been derived with regard to the number of calms in each month. The same applies to the results for the year.

1858-63.	Mean Temperature minus Temperature in Calms.	Mean Temperature in Calms.	1858-63.	Mean Temperature minus Temperature in Calms.	Mean Temperature in Calms.
March . . .	$+3^{\circ}81$	$61^{\circ}04$	June . . .	$+1^{\circ}00$	$48^{\circ}21$
April . . .	$+2^{\circ}75$	$55^{\circ}67$	July . . .	$+2^{\circ}87$	$44^{\circ}81$
Mai . . .	$+0^{\circ}98$	$52^{\circ}40$	August . .	$+3^{\circ}43$	$46^{\circ}61$
Autumn	$+2^{\circ}683$	$56^{\circ}205$	Winter . .	$+2^{\circ}705$	$46^{\circ}271$
September .	$+6^{\circ}20$	$47^{\circ}17$	December .	$+5^{\circ}47$	$59^{\circ}04$
October . .	$+3^{\circ}38$	$54^{\circ}42$	January . .	$+3^{\circ}40$	$64^{\circ}47$
November .	$+3^{\circ}18$	$58^{\circ}54$	February .	$+5^{\circ}96$	$59^{\circ}62$
Spring . . .	$+3^{\circ}533$	$54^{\circ}100$	Summer .	$+5^{\circ}372$	$60^{\circ}629$
Year . . .	$+4^{\circ}167$	$53^{\circ}665$			

We observe that the temperature during calms is invariably below the general mean temperature; the difference between both is least in May and June and greatest in September and February. It is rather surprising that the value for September does not fit in well between the differences for the adjoining months, but for this we may find some explanation if we consider, that the number of calms reaches its minimum during this month. A similar irregularity occurs in January, with but this difference, that the value is by far less than for any of the adjoining months; and from this and from the fact, that also in this month a minimum number of calms takes place, we feel inclined to believe that a greater number of years would abolish these discrepancies, but also that we may receive the results, embodied in this table, with great confidence.

IV. PRESSURE OF AQUEOUS VAPOR.

22. Notwithstanding the great efforts which have been made, to improve the formulae and tables required for the reduction of the observations on the aqueous vapor in our atmosphere, they are still far from being perfect. The importance of this branch of meteorological science, generally speaking, and the special interest attaching to it since the ingenious investigations of Professor Tyndall, bearing upon the relation between the tension of aqueous vapor and terrestrial radiation, make it imperative to bestow particular care on this subject. There still exists considerable difference between the results, derived according to various authorities and tables, and although M. Regnault's labors in this direction are universally admitted to be excellent it seems strange that hitherto it should have proved impossible to agree upon some uniform mode of reduction of the observations in question.

To mitigate this deficiency to some extent, it was thought fit to examine the various, methods of reduction, employed in England and on the Continent, somewhat closer. Eight formulae served to establish mean (Normal) values for aqueous pressure from 0.235 to 0.509. Included in this series of formulae and tables was the one given in R. I. page 2 and R. II. page 3 which reduced to English measure reads thus:

$$x = \frac{e - 0.0004324 (t - t') (b - e)}{1 + 0.0008555 (t - t')}$$

From the comparison of the various formulae we glean that, if we adopt the mean of all as a standard, the results according to the above show the smallest differences in case the most recent edition of M. Regnault's tables is employed. In computing the tension of aqueous vapor for the Flagstaff Observatory, however, the first edition of the tables, just referred to, and the slightly altered factors of the formula yielded results, the means of which may be considered identical with the adopted standard. Whereas the values for the lower tensions are too small, they increase gradually until reaching the Normal value, after which they are in excess. Thus the results, obtained by this mode, accommodate themselves to most of the results got by other methods, facilitating in this way an immediate comparison.

The following table contains some facts bearing upon this question:

t	t'	NORMALS	DIFFERENCE: (x - x')			
			I.	III.	VIII.	$\frac{I + VIII}{2}$
		inch.	inch.	inch.	inch.	inch.
39.05	38.30	0.2350	- 0.009	+ 0.005	+ 0.001	- 0.004
48.67	45.43	.2793	- .011	- .001	+ .010	.000
54.96	50.70	.3320	- .010	- .003	+ .010	.000
61.53	56.35	.4010	- .004	- .004	+ .006	+ .001
65.25	58.35	.4134	- .005	- .006	+ .002	- .001
68.94	63.25	.5126	+ .002	- .004	- .005	- .001
73.57	66.57	.5638	+ .006	- .005	- .012	- .003
77.17	68.15	.5740	+ .011	- .005	- .019	- .004
81.63	68.55	.5824	+ .014	- .007	- .015	- .000
86.82	69.68	.5090	+ .018	- .008	- .013	+ .002
65.759	58.533	.4352	+ .0012	- .0038	- .0035	- .0011

t and t' signify respectively the temperatures of dry and wet bulb, x the aqueous tension according to any special formula and x' the Normal value, in the above explained sense. Column I shows the differences according to the mode in use at the Observatory, column III those derived from the formula as given above; the values under VIII have been obtained by the aid of a factor, of which we shall have to speak in the next paragraph. The means of the results of calculations on pressure of vapor according to I and VIII furnish values tallying very closely with the adopted normals, as may be learnt by inspecting the differences under $\frac{I + VIII}{2}$.

23. Simultaneous observations on the temperature of the dry and wet bulb, and also on the temperature of the dew point by the aid of Daniell's hygrometer, made at the Royal Observatory Greenwich, were discussed with a view to determine factors (f) expressing a ratio between the difference: temperature of air (t) minus temperature of dewpoint (d), and that of temperature of air (t) minus temperature of evaporation (t'); $f = \frac{t-d}{t-t'}$. In a similar manner have been treated the observations made at the Flagstaff Observatory by the aid of the dry and wet bulb thermometers and Doebereiner — Regnault's aspirator-hygrometer. The manner in which the observations have been made was amply illustrated in „R. I. pag. 2 and R. II. pag. 3“, suffice it therefore to remind that the arrangements of the instruments were such, as to admit of comparisons being made, whenever it was deemed advisable, without involving any loss of time, or causing any particular trouble. In this way we succeeded in collecting a great number of simultaneous observations for the sole object of determining the factors just pointed out. Res. I. pag 74 contains the original observations for the months of January and February 1859; this series may afford a means by which to judge on the reliability of the observations.

An analysis of the results for the single years of observation is to be found in the sub-joined table, for the full understanding of which it may be stated that in each case the first value stands for 1859, the second for 1860, and so on to the fifth which stands for 1863. The general mean was taken with due regard to the number of values constituting the results for the single years.

Mean Temp. of Air. (t)	Number of Observations.	Mean factor for each year.	General mean factor. (f)	Mean Temp. of Air. (t)	Number of Observations.	Mean factor for each year.	General mean factor. (f)	Mean Temp. of Air. (t)	Number of Observations.	Mean factor for each year.	General mean factor. (f)	Mean Temp. of Air. (t)	Number of Observations.	Mean factor for each year.	General mean factor. (f)	Mean Temp. of Air. (t)	Number of Observations.	Mean factor for each year.	General mean factor. (f)
°	3	2.60		°	9	1.97		°	8	2.13		°	12	2.22		°	18	2.31	
36.41	4	3.50	2.98	37.44	11	2.85		38.51	6	1.95		39.40	12	2.58		40.43	16	2.45	
—	4	2.85	—	—	5	3.61	2.68	—	6	2.08	2.04	—	7	1.94	2.21	—	14	2.06	2.27
—	1	2.50	—	—	3	2.71	—	—	2	1.88	—	—	5	1.71	—	—	8	2.20	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
41.40	20	2.09			35	2.12			48	2.18			43	2.37			55	1.54	
—	21	2.59	2.21	42.35	25	2.32		43.38	30	2.41		44.44	35	2.30	2.23	45.39	37	2.14	
—	32	2.01	—	—	22	2.28	2.23	—	34	1.80	2.19	—	45	2.09	—	—	52	1.96	1.94
—	11	2.32	—	—	13	2.30	—	—	16	2.64	—	—	18	2.11	—	—	27	2.45	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
46.41	77	2.15			93	2.09			87	2.11			109	2.01			108	2.13	
—	60	1.65	1.96	47.35	53	2.09		48.38	68	1.99		49.40	66	2.05		50.36	110	2.01	
—	73	2.04	—	—	63	1.91	2.04	—	59	1.90	2.05	—	69	2.09	2.04	—	83	1.88	2.02
—	38	1.92	—	—	49	2.07	—	—	60	2.18	—	—	72	2.03	—	—	67	2.06	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1.77	—
51.40	129	2.07			99	2.09			99	2.08			117	1.91			114	2.04	
—	94	1.91	1.93	52.38	109	1.96		53.40	98	1.90		54.39	104	1.90		55.37	107	1.95	
—	77	1.72	—	—	95	1.97	1.97	—	87	2.24	2.05	—	92	1.89	1.90	—	102	1.93	1.96
—	87	1.94	—	—	99	1.90	—	—	85	2.00	—	—	82	1.89	—	—	87	1.90	—
—	1	2.18	—	—	7	1.79	—	—	3	2.04	—	—	10	2.05	—	—	4	2.13	—
56.38	104	2.02			103	2.53			108	2.01			95	1.97			77	2.02	
—	107	1.85	1.89	57.34	107	1.97		58.40	91	1.90		59.38	75	1.77		60.39	71	1.85	
—	91	1.89	—	—	93	1.57	1.99	—	100	1.98	1.94	—	84	1.89	1.88	—	75	1.79	1.87
—	86	1.76	—	—	107	1.89	—	—	76	1.86	—	—	82	1.88	—	—	82	1.82	—
—	11	2.23	—	—	6	1.80	—	—	20	1.79	—	—	22	1.78	—	—	20	1.87	—
61.39	68	1.94			74	1.91			68	1.89			72	1.97			53	2.06	
—	86	1.82	1.83	62.36	89	1.84		63.43	66	1.83		64.38	71	1.85		65.40	61	1.78	
—	77	1.78	—	—	78	1.81	1.83	—	77	1.85	1.84	—	70	1.79	1.86	—	64	1.78	1.87
—	54	1.73	—	—	70	1.80	—	—	67	1.81	—	—	53	1.87	—	—	60	1.92	—
—	16	1.94	—	—	13	1.63	—	—	18	1.72	—	—	10	1.67	—	—	13	1.74	—
66.40	43	2.01			48	1.90			45	1.92			33	1.87			38	1.89	
—	45	1.79	1.83	67.40	44	1.80		68.42	32	1.84		69.38	30	1.77		70.35	27	1.73	
—	58	1.77	—	—	50	1.73	1.81	—	43	1.76	1.82	—	51	1.92	1.84	—	35	1.73	1.78
—	46	1.83	—	—	48	1.81	—	—	52	1.79	—	—	27	1.77	—	—	56	1.80	—
—	20	1.67	—	—	10	1.79	—	—	21	1.81	—	—	7	1.81	—	—	15	1.70	—
71.44	30	1.89			20	2.09			15	1.78			22	1.83			17	1.94	
—	39	1.75	1.78	72.37	24	1.81		73.41	24	1.77		74.41	14	1.69		75.41	22	1.72	
—	45	1.74	—	—	29	1.77	1.83	—	30	1.81	1.78	—	12	1.66	1.73	—	20	1.69	1.78
—	31	1.81	—	—	36	1.78	—	—	21	1.77	—	—	14	1.74	—	—	15	1.83	—
—	9	1.62	—	—	11	1.79	—	—	3	1.78	—	—	8	1.61	—	—	7	1.76	—
76.37	15	1.77			9	1.82			12	1.86			14	1.84			13	1.74	
—	19	1.77	1.74	77.37	14	1.71		78.32	14	1.69		79.38	13	1.73		80.50	4	1.67	
—	12	1.72	—	—	18	1.69	1.76	—	15	1.69	1.74	—	10	1.71	1.75	—	8	1.74	1.74
—	11	1.73	—	—	13	1.99	—	—	12	1.84	—	—	11	1.73	—	—	10	1.84	—
—	4	1.56	—	—	5	1.50	—	—	5	1.52	—	—	1	1.34	—	—	3	1.54	—

On examining the several values we perceive forthwith that there are considerable irregularities in the above series; it was deemed preferable, however, to give the original results, without having them first subjected to a reduction by means of the method of the least squares. But in effecting the comparison of the various hygrometrical formulae and factors, above already alluded to, these irregularities had to be eliminated. Besides we notice that the hygrometrical factors of the above table are greater than those published by Mr. Glaisher; for the reason of this we must look to the difference in the mode of observation and the hygrometers used. The average difference between the tension of vapor, derived by the aid of the several hygrometrical formulae and that computed with the Greenwich factors is equal to — 0.0119, while the same quantity for our factors amounts only to — 0.0035.

24. Annual march of pressure of vapor. Analogous to the manner, fully explained when speaking on the annual march of pressure and temperature of air, was constructed the table in this paragraph, and there cannot be any occasion for a further comment upon this point.

The means for the several months have been used for the purpose of expressing, according to Bessel's interpolation formula, the annual fluctuation in pressure of vapor by the following series:

$$V^{(n)} = 0.3404 + 0.074 \sin \left\{ \left(n + \frac{1}{2} \right) 30^\circ + 29^\circ 27' \right\} + 0.008 \sin \left\{ \left(n + \frac{1}{2} \right) 60^\circ + 288^\circ 11' \right\} \\ + 0.002 \sin \left\{ \left(n + \frac{1}{2} \right) 90^\circ + 225^\circ 0' \right\} + \dots$$

An inquiry into the nature of this equation, with a view to determine the tropical periods, the time of the yearly maximum and minimum, shews that the first takes place on the 5.6th day of February and the latter on the 19.2th of July, thus corresponding well with the annual curve for temperature of air. It is hardly fair to expect, that these extremes should be distinctly discernible in the tables below, for we must remember that the values for each day were derived from but 5 daily means, and are therefore still apt to show considerable irregularities.

The differences between the calculated and observed values for the several monthly means, inserted at the foot of the table, sufficiently illustrate the reliability of the series proposed. The mean difference amounts to ± 0.00407 inch. only.

ANNUAL MARCH OF PRESSURE OF VAPOR.

(Mean for the year: 0.3404.)

1858—63.		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	Septbr.	October.	Novbr.	Decemb.	January.	Febr.
		inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
1 st		0.4608	0.3708	0.3358	0.3126	0.2620	0.2592	0.2756	0.3098	0.3580	0.3970	0.4206	0.3870
2 ^d		.4460	.3700	.3020	.2926	.2574	.2622	.2786	.2930	.3120	.3870	.4214	.4234
3 ^d		.4262	.4032	.2860	.2980	.2508	.2736	.2982	.2998	.2956	.3608	.3876	.4778
4 th		.4540	.4040	.3248	.2844	.2766	.2772	.3114	.3052	.2878	.3416	.4160	.4754
5 th		.4256	.3906	.3330	.2792	.2874	.2816	.3152	.3170	.3202	.3766	.4056	.4436
6 th		.4214	.3864	.3074	.2846	.2874	.2788	.3174	.3144	.3336	.3652	.4470	.3576
7 th		.4144	.3742	.3178	.2988	.2708	.2828	.3042	.3428	.3084	.3332	.4854	.3722
8 th		.4290	.3524	.3482	.2952	.2766	.2800	.3000	.3618	.3286	.3698	.4640	.3948
9 th		.3940	.3428	.3562	.3040	.2800	.2760	.3090	.3002	.3318	.3806	.4632	.3746
10 th		.4094	.3488	.3436	.2986	.2880	.2734	.2990	.3078	.3612	.4094	.4016	.3834
11 th		.4342	.3768	.3274	.3176	.2782	.2644	.3038	.3174	.3186	.3764	.3904	.4140
12 th		.4376	.3454	.3352	.3134	.2752	.3866	.2958	.3028	.3266	.3914	.3756	.4254
13 th		.4542	.3176	.3250	.2898	.2526	.2862	.2818	.3278	.3280	.3906	.3790	.4168
14 th		.4282	.3248	.3312	.2880	.2642	.2610	.2608	.3312	.3282	.4106	.4482	.4666
15 th		.3690	.3534	.3092	.2582	.2722	.2678	.2544	.3304	.3354	.3820	.4506	.4850
16 th		.3740	.3582	.2994	.2496	.2714	.2862	.2628	.3226	.3562	.3438	.4458	.4536
17 th		.3914	.3258	.2864	.2772	.2718	.2928	.2620	.2966	.3782	.3480	.4288	.4332
18 th		.3718	.3286	.2840	.2888	.2826	.2724	.2698	.2858	.3914	.3694	.4134	.4276
19 th		.3986	.3512	.3220	.2888	.2744	.2734	.2676	.2902	.4158	.4018	.4390	.3808
20 th		.3996	.3592	.3238	.3010	.2570	.2722	.2630	.2860	.3962	.4084	.4448	.3914
21 st		.3952	.3450	.2868	.2966	.2770	.2950	.2768	.3408	.3914	.3628	.4530	.3714
22 ^d		.4090	.3468	.3016	.2958	.2720	.3238	.2978	.3240	.3788	.4028	.3938	.4020
23 ^d		.4020	.3236	.3090	.2890	.2692	.3026	.2862	.3334	.4004	.4168	.4052	.4220
24 th		.3638	.3380	.2972	.2724	.2610	.2822	.2832	.3474	.3642	.3834	.4498	.4540
25 th		.3996	.3432	.2846	.2664	.2774	.2732	.3010	.3282	.2932	.4196	.4428	.3988
26 th		.3934	.3522	.2846	.2676	.2760	.2762	.3138	.3314	.3184	.4376	.4192	.3936
27 th		.3760	.3636	.3020	.2784	.2744	.2782	.3048	.3854	.3508	.3830	.4098	.3774
28 th		.3726	.3606	.3048	.2922	.2588	.2790	.2996	.3982	.3618	.3630	.3954	.4072
29 th		.3814	.3642	.3020	.2624	.2672	.2584	.2716	.3518	.3696	.3652	.3958	
30 th		.3654	.3322	.2906	.2588	.2680	.2556	.3076	.3358	.4158	.3898	.3918	
31 st		.3416		.3090		.2564	.2630		.3546		.4006	.4198	
MEANS	observed	0.4045	0.3551	0.3120	0.2867	0.2708	0.2773	0.2891	0.3250	0.3485	0.3828	0.4227	0.4147
	calculated	0.3989	0.3593	0.3136	0.2847	0.2718	0.2788	0.2933	0.3197	0.3506	0.3883	0.4144	0.4222
	calc. — observ.	—0.0056	+0.0042	+0.0016	—0.0020	+0.0010	+0.0015	+0.0042	—0.0053	+0.0021	+0.0055	—0.0083	+0.0075
MEANS FOR THE QUARTERS.		0.3572			0.2781			0.3209			0.4065		

In close connexion with the subject just treated is another one which may be briefly referred to. We mean the distribution of relative humidity throughout the year, for which purpose the penthemeral means seem to offer an excellent opportunity. In merely glancing at the table we are struck by the distinctness with which the two main periods of the year, as characterized by the mean direction of the wind, make themselves manifest. In the second period of April the humidity of air increases rapidly until reaching its maximum value in the 4th period of July; after that it decreases slowly to the middle of October, when it commences to descend more rapidly to its minimum value, occurring in the last penthemeral period of the year.

Mean „Five day Means“ in Relative Humidity for the years 1858 to 1863.

NUMBER OF THE PERIOD in the resp. MONTHS.	Jan.	Febr.	March.	April.	May.	June.	July.	Aug.	Sept.	Octbr.	Nov.	Dec.
	(1-5)	(31-4)	(2-6)	(1-5)	(1-5)	(31-4)	(5-9)	(4-8)	(3-7)	(3-7)	(2-6)	(2-6)
	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)	(0-1)
1	0.6004	0.6784	0.6846	0.6816	0.7248	0.8514	0.8110	0.8296	0.7512	0.6728	0.6708	0.6318
2	0.6440	0.6448	0.6494	0.7332	0.7660	0.8328	0.8228	0.7920	0.7550	0.7268	0.6486	0.6758
3	0.6266	0.6770	0.6234	0.7132	0.7438	0.8050	0.8332	0.8208	0.7164	0.6636	0.6560	0.6472
4	0.6920	0.7182	0.6856	0.7606	0.7620	0.8320	0.8360	0.7336	0.7078	0.7010	0.6540	0.6542
5	0.6220	0.6684	0.6990	0.7600	0.7938	0.8184	0.8118	0.7008	0.7282	0.7090	0.6014	0.6820
6	0.6452	0.6516	0.6618	0.7322	0.8114	0.8070	0.8258	0.7334	0.6934	0.7470	0.6868	0.5972
						0.8038						

25. Diurnal fluctuation of pressure of vapor. On several occasions we have described the method according to which the tables for diurnal fluctuation have been constructed. The present case does not form an exception therefrom, and we may be allowed to refer for full information to „R. I. pag. 57“ and append. 13.

Treating the table contained in this paragraph by the method of the least squares we obtain the following interpolation series, expressing the diurnal fluctuation of pressure of aqueous vapor for every month and for the year:

$$\begin{aligned}
 \text{For March. } V^{(n)} &= 0.4033^{\text{inch.}} + 0.0100 \sin(n15^\circ + 3^\circ 49') + 0.0048 \sin(n30^\circ + 132^\circ 53') \\
 &\quad + 0.0035 \sin(n45^\circ + 199^\circ 17') + \dots \\
 \text{„ April . } &= 0.3543 + 0.0127 \sin(n15^\circ + 28^\circ 15') + 0.0058 \sin(n30^\circ + 124^\circ 23') \\
 &\quad + 0.0032 \sin(n45^\circ + 156^\circ 48') + \dots \\
 \text{„ May . } &= 0.3118 + 0.0112 \sin(n15^\circ + 37^\circ 28') + 0.0042 \sin(n30^\circ + 128^\circ 29') \\
 &\quad + 0.0027 \sin(n45^\circ + 165^\circ 32') + \dots \\
 \text{„ June . } &= 0.2875 + 0.0158 \sin(n15^\circ + 38^\circ 59') + 0.0048 \sin(n30^\circ + 80^\circ 3') \\
 &\quad + 0.0027 \sin(n45^\circ + 130^\circ 2') + \dots \\
 \text{„ July . } &= 0.2690 + 0.0136 \sin(n15^\circ + 37^\circ 17') + 0.0047 \sin(n30^\circ + 93^\circ 4') \\
 &\quad + 0.0029 \sin(n45^\circ + 142^\circ 8') + \dots \\
 \text{„ August . } &= 0.2785 + 0.0132 \sin(n15^\circ + 34^\circ 12') + 0.0045 \sin(n30^\circ + 125^\circ 10') \\
 &\quad + 0.0026 \sin(n45^\circ + 160^\circ 58') + \dots \\
 \text{„ September } &= 0.2902 + 0.0139 \sin(n15^\circ + 31^\circ 47') + 0.0054 \sin(n30^\circ + 138^\circ 44') \\
 &\quad + 0.0029 \sin(n45^\circ + 215^\circ 32') + \dots
 \end{aligned}$$

$$\begin{aligned}
\text{For October. } V^{(n)} &= 0.3266 + 0.0153 \sin(n15^\circ + 37^\circ 30') + 0.0064 \sin(n30^\circ + 152^\circ 23') \\
&\quad + 0.0022 \sin(n45^\circ + 225^\circ 0') + \dots \\
\text{,, November} &= 0.3510 + 0.0103 \sin(n15^\circ + 8^\circ 51') + 0.0050 \sin(n30^\circ + 181^\circ 55') \\
&\quad + 0.0015 \sin(n45^\circ + 266^\circ 49') + \dots \\
\text{,, December} &= 0.3837 + 0.0095 \sin(n15^\circ + 357^\circ 59') + 0.0045 \sin(n30^\circ + 184^\circ 14') \\
&\quad + 0.0022 \sin(n45^\circ + 234^\circ 28') + \dots \\
\text{,, January} &= 0.4225 + 0.0100 \sin(n15^\circ + 357^\circ 8') + 0.0058 \sin(n30^\circ + 157^\circ 8') \\
&\quad + 0.0025 \sin(n45^\circ + 211^\circ 36') + \dots \\
\text{,, February} &= 0.4163 + 0.0132 \sin(n15^\circ + 15^\circ 48') + 0.0033 \sin(n30^\circ + 126^\circ 52') \\
&\quad + 0.0018 \sin(n45^\circ + 213^\circ 8') + \dots \\
\text{,, Year} &= 0.3412 + 0.0121 \sin(n15^\circ + 26^\circ 7') + 0.0047 \sin(n30^\circ + 134^\circ 34') \\
&\quad + 0.0016 \sin(n45^\circ + 180^\circ 36') + \dots
\end{aligned}$$

Diurnal Fluctuation of Pressure of Vapor.

HOUR	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr	Novbr.	Decbr	Jan.	Febr.	Year
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
Midnight	0.407	0.352	0.308	0.281	0.264	0.273	0.285	0.321	0.349	0.384	0.424	0.415	0.3386
1h AM	0.406	0.347	0.305	0.281	0.263	0.270	0.282	0.316	0.345	0.381	0.421	0.411	0.3357
2	0.398	0.346	0.302	0.276	0.259	0.267	0.280	0.311	0.342	0.377	0.415	0.408	0.3318
3	0.395	0.343	0.300	0.274	0.258	0.266	0.275	0.307	0.339	0.374	0.412	0.403	0.3288
4	0.390	0.339	0.298	0.272	0.255	0.264	0.271	0.303	0.335	0.369	0.408	0.403	0.3256
5	0.386	0.336	0.298	0.272	0.253	0.262	0.269	0.300	0.334	0.368	0.402	0.398	0.3232
6	0.384	0.334	0.298	0.270	0.253	0.261	0.267	0.306	0.341	0.375	0.408	0.393	0.3242
7	0.390	0.336	0.298	0.270	0.252	0.263	0.278	0.320	0.349	0.382	0.413	0.407	0.3298
8	0.399	0.348	0.306	0.274	0.258	0.270	0.290	0.328	0.348	0.379	0.416	0.411	0.3356
9	0.403	0.358	0.315	0.285	0.268	0.282	0.297	0.335	0.349	0.381	0.421	0.413	0.3423
10	0.407	0.362	0.322	0.296	0.278	0.288	0.298	0.337	0.353	0.381	0.422	0.415	0.3466
11	0.406	0.364	0.322	0.299	0.282	0.290	0.299	0.336	0.354	0.384	0.428	0.421	0.3488
Noon	0.407	0.366	0.324	0.304	0.283	0.288	0.296	0.337	0.350	0.383	0.427	0.420	0.3488
1h PM	0.404	0.365	0.318	0.306	0.281	0.288	0.298	0.341	0.347	0.386	0.430	0.422	0.3488
2	0.407	0.362	0.319	0.302	0.281	0.289	0.302	0.335	0.354	0.384	0.424	0.426	0.3488
3	0.407	0.362	0.319	0.302	0.280	0.287	0.302	0.336	0.357	0.381	0.425	0.428	0.3488
4	0.406	0.360	0.318	0.300	0.280	0.286	0.298	0.332	0.360	0.386	0.425	0.426	0.3481
5	0.410	0.360	0.320	0.298	0.278	0.289	0.300	0.334	0.361	0.391	0.428	0.426	0.3496
6	0.413	0.364	0.320	0.298	0.277	0.288	0.300	0.339	0.357	0.398	0.431	0.427	0.3510
7	0.415	0.364	0.319	0.295	0.275	0.287	0.299	0.335	0.362	0.399	0.432	0.427	0.3508
8	0.412	0.363	0.316	0.291	0.273	0.284	0.298	0.337	0.362	0.392	0.434	0.424	0.3488
9	0.410	0.361	0.315	0.288	0.271	0.282	0.297	0.336	0.363	0.392	0.433	0.425	0.3478
10	0.410	0.357	0.313	0.285	0.268	0.282	0.292	0.330	0.360	0.391	0.431	0.423	0.3452
11	0.406	0.354	0.309	0.282	0.266	0.277	0.292	0.326	0.354	0.390	0.429	0.419	0.3420

A discussion, calculated to throw light on the question of the reliability of the foregoing formulae and table, gave highly satisfactory results, as may be learnt on examining the subjoined differences: „calculated minus observed values of the diurnal fluctuation of pressure of vapor.“

HOUR	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
Midnight	0.000	0.000	0.000	-0.001	0.000	+0.001	+0.003	+0.001	+0.002	+0.001	+0.003	+0.001	+0.0007
1 ^h AM	-0.001	+0.002	+0.001	-0.002	0.000	+0.001	+0.002	0.000	0.000	0.000	+0.001	+0.004	-0.0001
2	+0.002	0.000	+0.001	+0.002	+0.002	+0.002	-0.001	0.000	-0.002	0.000	+0.002	0.000	-0.0002
3	-0.001	-0.001	0.000	+0.001	0.000	-0.001	0.000	-0.001	-0.002	-0.002	-0.001	0.000	-0.0012
4	-0.001	-0.001	0.000	0.000	0.000	-0.002	-0.002	0.000	+0.001	+0.001	-0.001	-0.004	-0.0011
5	0.000	-0.001	-0.002	-0.002	-0.001	-0.002	0.000	+0.005	+0.003	+0.002	+0.004	0.000	+0.0004
6	+0.002	+0.001	-0.001	-0.001	-0.002	0.000	+0.005	+0.001	0.000	-0.002	0.000	+0.006	+0.0011
7	+0.001	+0.004	+0.003	+0.001	+0.002	+0.003	+0.001	-0.002	-0.004	-0.005	0.000	-0.006	-0.0001
8	-0.002	-0.001	+0.001	+0.003	+0.002	+0.002	-0.003	-0.002	+0.001	+0.002	+0.002	-0.003	+0.0001
9	0.000	-0.003	-0.001	0.000	0.000	-0.002	-0.003	-0.002	+0.002	+0.002	+0.002	+0.001	-0.0006
10	0.000	0.000	-0.002	-0.002	-0.002	-0.002	0.000	0.000	-0.001	+0.003	+0.003	+0.003	0.0000
11	+0.002	+0.002	0.000	+0.001	-0.001	0.000	+0.001	+0.002	-0.003	-0.001	-0.003	-0.001	+0.0004
Noon	-0.001	0.000	-0.001	0.000	+0.001	+0.002	+0.003	0.000	+0.001	-0.002	-0.004	+0.002	+0.0011
1 ^h PM	+0.001	-0.001	+0.003	-0.001	+0.002	+0.001	+0.001	-0.005	+0.004	-0.005	-0.009	+0.002	+0.0006
2	-0.002	0.000	0.000	+0.001	0.000	-0.002	-0.003	+0.001	-0.001	-0.001	-0.003	-0.002	-0.0004
3	-0.001	-0.002	-0.001	-0.001	-0.001	0.000	-0.003	0.000	-0.002	+0.005	-0.002	-0.003	-0.0006
4	+0.003	0.000	0.000	-0.001	-0.002	+0.001	+0.002	+0.005	-0.002	+0.004	+0.001	+0.001	+0.0006
5	+0.002	+0.002	0.000	0.000	0.000	-0.001	+0.001	+0.004	-0.001	+0.002	+0.002	+0.002	0.0000
6	0.000	0.000	0.000	-0.001	0.000	0.000	+0.001	-0.002	+0.004	-0.003	+0.001	+0.001	-0.0007
7	-0.002	0.000	0.000	0.000	+0.001	0.000	0.000	+0.001	0.000	-0.004	+0.002	-0.002	-0.0007
8	0.000	-0.001	+0.001	+0.001	+0.001	+0.001	-0.001	-0.003	0.000	+0.002	0.000	+0.001	+0.0003
9	0.000	-0.001	0.000	+0.001	0.000	0.000	-0.002	-0.004	-0.002	+0.001	0.000	-0.002	-0.0005
10	-0.001	0.000	-0.001	0.000	0.000	-0.003	+0.001	-0.001	-0.001	0.000	0.000	-0.002	-0.0002
11	+0.002	0.000	0.000	0.000	-0.001	-0.001	-0.001	0.000	+0.001	-0.001	+0.001	0.000	+0.0004

The alternating character of the algebraic sign, and the minuteness of the differences sufficiently illustrate, how well the formulae accord with actual observations.

The tropical hours and the corresponding values of pressure of vapor have also been determined in the manner explained, when speaking on the general principles of these discussions. The table below shows the results:

MONTHS.	MAXIMUM.		MINIMUM.		MONTHS.	MAXIMUM.		MINIMUM.	
	Time P. M.	Value.	Time	Value		Time P. M.	Value	Time	Value
	h. m.	inch.	h. m.	inch.		h. m.	inch.	h. m.	inch.
March .	6 20	0.4132	5 17	0.3856	September	5 11	0.3012	4 37	0.2685
April .	11 37*	.3665	5 24	.3348	October	11 5*	.3380	4 9	.3033
May .	11 30*	.3228	5 8	.2959	November	7 18	.3622	3 53	.3356
June .	12 46	.3051	5 50	.2686	December	6 46	.3951	4 21	.3700
July .	12 20	.2839	5 44	.2511	January	7 27	.4337	4 50	.4058
August	11 49*	.2905	5 10	.2604	February	5 24	.4280	5 1	.3980
Year .	6 24	.3503	4 52	.3237					

* The asterisks signify that the resp. times are, exceptionally, understood to occur in the forenoon.

Examining the daily amplitude, as eliciting from this table, somewhat closer, we find that its amounts throughout the year do not show any regular increase or decrease, as we should be led to anticipate from the nature of the element in question. For this singular fact we are able to account in this way: the times of the daily extremes are subjected to great irregularities, whereby the daily amplitudes, as represented by monthly or yearly means, are considerably diminished. In order to mitigate this deficiency in the evidence on the nature of the pressure of vapor in our atmosphere, the following little table was compiled, exhibiting the mean daily ranges of this meteorological element for the several months, quarters and for the year. From it we glean that the daily range referred to, coincides in its annual march with the temperature of air, reaching its maximum and minimum value respectively in January and July. The monthly range shows similar relations, as becomes evident by the values in the second column. The table contains moreover the mean yearly range and the range during the entire period of observation.

1858—63.	MEAN RANGE		1858—63.	MEAN RANGE	
	daily.	monthly.		daily.	monthly.
	inches.	inches.		inches.	inches.
March . . .	0·1406	0·3880	June . . .	0·0778	0·2178
April . . .	0·1126	0·3408	July . . .	0·0748	0·2048
May . . .	0·0858	0·2350	August . . .	0·0860	0·2350
Autumn . .	0·11300	0·32127	Winter . .	0·07953	0·21920
September .	0·1018	0·2654	December .	0·1400	0·3910
October . .	0·1228	0·3826	January . .	0·1576	0·4368
November .	0·1338	0·3996	February .	0·1350	0·4336
Spring . .	0·11947	0·34920	Summer . .	0·14420	0·42050
Year . . .	0·11405	0·32754	M. Yearly R.	0·54220	
	R. during the entire Period of obs. $0\cdot6200$ $\left. \begin{array}{l} \text{Min. } \frac{3\cdot4}{\text{VIII}} \\ \text{Max. } \frac{25\cdot5}{\text{I}} \end{array} \right\} 59$				

26. Windrose for pressure of vapor. The monthly and yearly means of pressure of vapor for every point of the compass in the year 1858—59 have already been published in R. I. pag. 66, and tables, similar to the one just referred to, have been embodied in Appendix 14 of this volume. The last of the five tables, relating to this subject, shows the general means for 32 points derived from observations during the years 1858—63. The reduction of these means from 32 to 16 points has been carried out in the manner described in the introduction. The subjoined table gives the results.

Monthly Means of Pressure of Vapor for sixteen points of the Compass.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	Septbr.	Octbr.	Novbr.	Decbr.	Jan.	Febr.
	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
S.	0.4068	0.3648	0.3432	0.2893	0.2782	0.2868	0.2954	0.3278	0.3498	0.3920	0.4165	0.4277
S.S.E.	0.3883	0.3683	0.3400	0.2872	0.2725	0.2658	0.2879	0.3185	0.3530	0.3769	0.4031	0.4064
S.E.	0.3826	0.3661	0.3579	0.2854	0.2790	0.2631	0.2782	0.3166	0.3502	0.3697	0.4089	0.3949
E.S.E.	0.3801	0.3641	0.3344	0.2812	0.2588	0.2453	0.2790	0.3208	0.3536	0.3760	0.4183	0.3947
E.	0.4149	0.3676	0.3337	0.2912	0.2594	0.2746	0.2902	0.3441	0.3839	0.4148	0.4629	0.4006
E.N.E.	0.4215	0.3568	0.3216	0.2671	0.2623	0.2704	0.2811	0.3480	0.3732	0.4100	0.4690	0.4296
N.E.	0.4137	0.3476	0.2931	0.2693	0.2507	0.2674	0.2821	0.3390	0.3666	0.4227	0.4594	0.4337
N.N.E.	0.4133	0.3511	0.3092	0.2822	0.2716	0.2766	0.2952	0.3358	0.3626	0.4042	0.4510	0.4223
N.	0.4034	0.3459	0.3144	0.2910	0.2723	0.2828	0.3003	0.3350	0.3432	0.3815	0.4352	0.4066
N.N.W.	0.4124	0.3421	0.3110	0.2873	0.2734	0.2804	0.2942	0.3106	0.3515	0.3789	0.4167	0.3888
N.W.	0.4048	0.3483	0.3004	0.2822	0.2625	0.2770	0.2798	0.3023	0.3344	0.3782	0.4080	0.4253
W.N.W.	0.4168	0.3312	0.2916	0.2858	0.2701	0.2630	0.2781	0.3104	0.3457	0.3679	0.3975	0.3995
W.	0.3802	0.3354	0.3085	0.3034	0.2780	0.2762	0.2859	0.3040	0.3293	0.3551	0.3862	0.3949
W.S.W.	0.3916	0.3525	0.3052	0.3131	0.2863	0.2880	0.2917	0.3177	0.3470	0.3601	0.4145	0.4161
S.W.	0.4229	0.3601	0.3277	0.3177	0.2882	0.2903	0.3030	0.3256	0.3567	0.3802	0.4357	0.4278
S.S.W.	0.4130	0.3767	0.3261	0.3028	0.2836	0.2812	0.2876	0.3262	0.3454	0.3863	0.4189	0.4304
u =	0.40414	0.35491	0.31987	0.28976	0.27168	0.27430	0.28810	0.32390	0.35304	0.38465	0.42511	0.41245

„U“ is simply the arithmetical mean for any of the 16 constituting values, irrespective of the relative frequency of the wind, and it is evident that these values are not influenced by the properties of any special wind, while on the other hand the general mean of the month must necessarily be affected by the properties of the predominating wind with special regard to the pressure of vapor in our atmosphere. If we call the general means for the several months m , $u - m$ throughout the year results thus:

March*: — 0.0004 (S.S.W.); April: — 0.0002 (N.W. by W.); May*: + 0.0079 (N.N.W.); June*: + 0.0031 (N. by E.); July*: + 0.0009 (N. $\frac{1}{2}$ W.); August: — 0.0030 (N.N.W.); September: — 0.0010 (N.N.W.); October: — 0.0011 (W. by N.); November: + 0.0045 (S.W. by S.); December: + 0.0018 (S.S.W.); January: + 0.0024 (S.S.W.); February*: — 0.0023 (S. by W.); Year*: + 0.0014 (N.W. $\frac{1}{2}$ W.).

The wind — directions within the brackets are the monthly mean directions, given only to the nearest point.

The influence of the mean direction of the wind on the state of our atmosphere, with regard to pressure of aqueous vapor, is not so distinctly expressed in the above series, as we have noticed it to be the case with respect to the other meteorological elements already treated. The algebraic signs, forming the criterion for the influence of any special direction of the wind, show in some months a similarity to those for pressure of air and in others to those for temperature. The latter case, being in conformity with the theoretical views on this subject, is regarded as the rule, and the exceptions in the above series were consequently distinguished by asterisks. We shall presently have to refer again to these apparent irregularities.

The method applied in the reduction of monthly to quarterly mean values, in case the constituting figures have not been derived from an equal number of observations, has been fully explained, so as to cause the table of this paragraph „Windrose for pressure of vapor“ to be at once understood.

DIRECTION OF WIND.	Derived from observations during the years 1858 to 63.														
	AUTUMN			WINTER			SPRING			SUMMER			YEAR		
	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	0.3654	0.3650	+0.0004	0.2865	0.2849	+0.0016	0.3219	0.3238	-0.0019	0.4080	0.4122	-0.0042	0.3429	0.3462	-0.0033
S.S.E.	.3625	.3580	+ .0045	.2786	.2753	+ .0033	.3209	.3202	+ .0007	.4013	.3949	+ .0064	.3388	.3355	+ .0033
S.E.	.3590	.3567	+ .0023	.2711	.2769	- .0058	.3216	.3185	+ .0031	.3998	.3908	+ .0090	.3367	.3333	+ .0034
E.S.E.	.3572	.3500	+ .0072	.2664	.2617	+ .0047	.3249	.3202	+ .0047	.4064	.3952	+ .0112	.3381	.3323	+ .0058
E.	.3579	.3700	- .0121	.2658	.2749	- .0091	.3299	.3430	- .0131	.4190	.4307	- .0117	.3427	.2567	- .0140
E.N.E.	.3600	.3679	- .0079	.2683	.2651	+ .0032	.3340	.3320	+ .0020	.4311	.4372	- .0061	.3476	.2503	- .0027
N.E.	.3614	.3502	+ .0112	.2717	.2625	+ .0092	.3347	.3266	+ .0081	.4355	.4395	- .0040	.3497	.3396	+ .0101
N.N.E.	.3604	.3562	+ .0042	.2742	.2766	- .0024	.3309	.3309	.0000	.4287	.4268	+ .0019	.3474	.3444	+ .0030
N.	.3564	.3554	+ .0010	.2749	.2817	- .0068	.3235	.3280	- .0045	.4130	.4092	+ .0038	.3413	.3438	- .0025
N.N.W.	.3511	.3549	- .0038	.2748	.2761	- .0013	.3155	.3180	- .0025	.3953	.3968	- .0015	.3344	.3386	- .0042
N.W.	.3470	.3565	- .0095	.2757	.2735	+ .0022	.3100	.3062	+ .0038	.3836	.4028	- .0192	.3301	.3324	- .0023
W.N.W.	.3464	.3428	+ .0036	.2788	.2726	+ .0062	.3089	.3110	- .0021	.3826	.3879	- .0053	.3305	.3293	+ .0012
W.	.3499	.3430	+ .0069	.2840	.2843	- .0003	.3119	.3075	+ .0044	.3912	.3781	+ .0131	.3351	.3296	+ .0055
W.S.W.	.3560	.3499	+ .0061	.2885	.2946	- .0061	.3168	.3191	- .0023	.4035	.3967	+ .0068	.3412	.3396	+ .0016
S.W.	.3622	.3705	- .0083	.2927	.2959	- .0032	.3209	.3216	- .0007	.4123	.4146	- .0023	.3455	.2512	- .0057
S.S.W.	.3656	.3709	- .0053	.2918	.2880	+ .0038	.3225	.3219	+ .0006	.4135	.4113	+ .0022	.3460	.3458	+ .0002
u =		0.3574			0.2778			0.3218			0.4078			0.3405	

Local peculiarities cause the influence of the predominating wind on the aqueous vapor in the atmosphere to become less clearly exhibited by the above table, for we have the differences „u — m“ here as follows:

Autumn: + 0.0002 (N. W. $\frac{1}{2}$ N.); Winter: — 0.0003 (N. by W.); Spring: + 0.0009 (W. N. W. $\frac{1}{2}$ W.); Summer: + 0.0013 (S. S. W.); the year: + 0.0001 (N. W. $\frac{1}{2}$ W.).

We find these disturbing causes still further illustrated by the following discussions, executed for the purpose of determining by the method of the least squares the interpolation series for the various quarters and for the year. Using the above values we obtain by Bessel's formula the following equations:

$$\begin{aligned}
 \text{Autumn: } V^{(m)} &= 0.3574 + 0.0060 \sin(m 22^\circ 30' + 48^\circ 22') + 0.0056 \sin(m 45^\circ 0' + 141^\circ 30') + \dots \\
 \text{Winter: } &= 0.2778 + 0.0108 \sin(m 22^\circ 30' + 147^\circ 29') + 0.0053 \sin(m 45^\circ 0' + 146^\circ 37') + \dots \\
 \text{Spring: } &= 0.3218 + 0.0090 \sin(m 22^\circ 30' + 354^\circ 55') + 0.0061 \sin(m 45^\circ 0' + 171^\circ 28') + \dots \\
 \text{Summer: } &= 0.4078 + 0.0141 \sin(m 22^\circ 30' + 349^\circ 48') + 0.0163 \sin(m 45^\circ 0' + 170^\circ 29') + \dots \\
 \text{Year: } &= 0.3405 + 0.0039 \sin(m 22^\circ 30' + 11^\circ 53') + 0.0073 \sin(m 45^\circ 0' + 167^\circ 18') + \dots
 \end{aligned}$$

As in the previous cases of a similar nature, the above table contains also those values which have been got by the aid of the formulae; beside both are placed the differences between the values observed, and those calculated. These differences tend to convince us of the accuracy of the adopted equations, because the mean errors for the various seasons, commencing with autumn are: ± 0.0059 ; ± 0.0043 ; ± 0.0034 ; 0.0068 and for the year: ± 0.0043 .

There remain still to be ascertained those points of the compass, characterised as maxima and minima. A careful solution of the problem connected with this question resulted the following, if we also include the designation of such points of the compass in which the pressure of aqueous vapor attains a mean value:

	MAXIMUM.		MINIMUM.		MEAN.	
	position.	value.	position.	value.	positions.	
		inch.		inch.		
Autumn . .	S. 347° 10' E.	0.3660	S. 239° 31' E.	0.3462	S. 81° 0' E., S. 175° 16' E., S. 297° 0' E., and S. —° —' E.	
Winter . .	321 45	.2978	82 21	.2657	24 45	— — 241 52 „ — —
Spring . .	127 34	.3350	241 25	.3088	47 15	184 43 323 59 „ 2 15
Summer . .	133 5	.4356	238 10	.3817	70 25	186 25 301 37 „ 0 34
Year . . .	134 53	.3497	234 27	.3297	80 6	182 28 289 55 „ 12 49

The range of the pressure of vapor within the compass of the windrose appears to be smallest in autumn and spring viz: 0.0198 and 0.0262 respect., greatest in winter and summer viz: 0.0321 and 0.0539 respect., the mean range for the year being 0.0200. The position of the minimum remains throughout the year in the N.W. quadrant, subjected to but slight oscillations, the winter forming, however, an exception, as in this season the minimum pressure of vapor occurs in the east. With regard to the position of the maximum the year shows two distinct characters: during autumn and winter the same takes place in the S.W. quadrant, while during spring and summer it occurs in N.E. These deviations, from what we should expect to be the law, are to be accounted for by the same local causes, alluded to when speaking on the thermic windrose. This subject is still more illustrated by some remarks in „Explanation of Diagrams“, to which we must refer those desirous of investigating this matter thoroughly.

27. Previously to leaving this subject there may be added a few facts, bearing on the state of our atmosphere, with respect to aqueous vapor, during calms. The following little table gives the results of an investigation of this kind, derived from 1484 single observations:

1858—63.	Mean Pr. minus Pressure in Calms.	PRESSURE.	1858—63.	Mean Pr. minus Pressure in Calms.	PRESSURE.
	inch.	inch.		inch.	inch.
March . . .	—0.0335	0.4370	June . . .	—0.0084	0.2951
April . . .	—0.0166	0.3717	July . . .	+0.0057	0.2651
May . . .	—0.0203	0.3323	August . .	+0.0037	0.2736
Autumn . .	—0.0210	0.3782	Winter . .	+0.0027	0.2754
September .	+0.0260	0.2731	December .	—0.0004	0.3832
October . .	—0.0188	0.3438	January . .	—0.0513	0.4740
November .	—0.0335	0.3820	February . .	—0.0033	0.4180
Spring . . .	—0.0191	0.3400	Summer . .	—0.0128	0.4393
Year . . .	—0.0076	0.34797			

The differences „general mean pressure minus pressure in calms“ give us to understand that the pressure of aqueous vapor during calms is as a rule considerably higher than the general mean value corresponding, the winterseason presenting itself as an exception (more correctly the months of July, August, September).

V. PRESSURE OF DRY AIR.

28. After having explicitly given all information, respecting pressure of air (P) and aqueous vapor (V) in chapter II. and IV., little remains to be added in order to cause the matter of this chapter to be clearly understood. The values of this table, intended to exhibit the fluctuation of the pressure of dry air (gaseous pressure) throughout the year, are the differences (P—V) between the corresponding values in paragr. 9 and 24. From the subjoined table we derive by the aid of Bessel's interpolation formula the following equation, expressing the law of annual fluctuation in the gaseous pressure of our atmosphere:

$$p^{(n)} = 29.5553 + 0.157 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 227^\circ 26' \right\} + 0.025 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 186^\circ 44' \right\} + 0.029 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 107^\circ 43' \right\} + \dots$$

According to this series the monthly mean pressure of dry air was computed; the results appear at the foot of the table, beneath the mean values received by actual observation. The smallness of the differences goes to prove the close accordance between both.

ANNUAL MARCH OF PRESSURE OF DRY AIR.

(Mean for the year: 29.5553.)

1858—63.		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	Septbr.	October.	Novbr.	Decemb.	January.	Febr.
		inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
1 st		29.3956	29.6254	29.5436	29.5946	29.6670	29.8878	29.7548	29.5390	29.3906	29.3402	29.3328	29.4534
2 ^d		.4320	.5698	.6878	.6872	.6966	.9088	.7616	.5880	.4720	.2456	.3536	.4184
3 ^d		.4298	.4826	.7582	.7560	.7076	.8968	.7878	.7382	.5772	.3124	.4122	.3130
4 th		.3402	.4762	.7600	.8316	.6494	.8722	.6958	.7416	.6410	.4502	.3738	.2990
5 th		.4578	.4468	.7742	.8710	.6412	.7782	.6176	.7031	.6050	.4356	.4226	.4002
6 th		.4780	.4758	.8186	.8292	.6324	.7422	.6016	.6370	.5998	.4480	.4320	.5204
7 th		.4546	.5302	.7996	.7322	.6578	.7006	.5656	.4900	.6110	.4800	.3382	.4074
8 th		.4272	.6432	.7382	.6262	.6996	.6856	.5030	.4072	.6086	.4400	.2950	.4226
9 th		.4302	.6926	.7046	.5354	.6524	.6930	.5176	.6216	.5800	.4264	.2300	.4244
10 th		.4852	.5726	.7100	.6006	.6122	.5792	.6030	.5580	.5048	.3036	.3062	.4662
11 th		.5120	.4088	.5974	.6450	.5978	.5568	.5498	.5588	.5168	.3714	.3668	.3406
12 th		.5296	.6030	.4137	.6992	.5802	.6244	.6372	.6296	.6120	.3130	.4850	.3508
13 th		.5122	.7100	.4868	.7842	.6474	.6598	.5470	.6268	.5326	.3468	.4242	.3940
14 th		.5004	.7164	.5822	.8288	.5738	.7724	.4818	.6078	.5600	.3386	.2782	.2938
15 th		.5390	.5916	.5294	.8650	.5474	.7624	.5412	.5876	.6570	.3408	.3000	.2464
16 th		.4146	.5832	.5090	.7812	.6758	.7466	.5980	.5642	.5732	.3756	.3496	.2784
17 th		.4096	.6342	.4638	.6586	.7560	.7922	.6658	.6922	.4068	.4168	.3764	.2736
18 th		.5224	.6834	.4928	.5506	.8062	.7640	.6216	.6362	.4014	.3622	.3664	.2994
19 th		.5006	.7368	.4426	.5160	.8386	.6608	.6066	.5574	.3542	.2428	.4062	.3954
20 th		.4698	.8096	.4968	.5252	.7896	.6000	.5772	.6012	.4210	.2482	.3682	.3966
21 st		.5404	.7770	.5860	.5446	.6560	.4956	.4904	.5706	.4476	.4172	.1820	.4978
22 ^d		.5332	.6678	.6170	.6006	.6798	.5478	.4382	.6126	.4264	.3578	.2028	.4206
23 ^d		.5020	.6204	.6574	.4734	.6104	.6366	.5154	.5688	.3418	.3200	.3714	.3438
24 th		.5742	.6960	.6292	.6356	.7114	.7016	.6282	.5752	.4396	.4468	.3972	.3892
25 th		.5400	.7548	.6442	.5876	.7536	.8044	.6420	.6712	.5456	.4322	.3146	.5650
26 th		.5946	.7538	.5870	.6610	.6780	.7442	.5320	.6146	.5510	.3546	.3542	.5642
27 th		.6824	.6748	.5054	.6190	.6902	.6668	.4956	.4428	.5114	.4198	.4248	.6010
28 th		.6540	.5854	.5832	.6268	.7634	.7392	.5358	.3376	.5122	.5272	.4288	.5080
29 th		.6162	.5308	.6152	.6966	.8230	.8032	.5754	.4672	.4902	.6158	.3958	
30 th		.5612	.5380	.6172	.6444	.8794	.7406	.5964	.4894	.4196	.5400	.4584	
31 st		.6758		.5802		.9022	.7564		.4604		.4160	.3812	
MEANS	observed	29.5069	29.6197	29.6110	29.6669	29.6960	29.7200	29.5891	29.5772	29.5104	29.3899	29.3595	29.4062
	calculated	29.5231	29.5996	29.6234	29.6663	29.7130	29.6910	29.6169	29.5598	29.5066	29.4149	29.3488	29.4002
	calc. — observ.	+0.0162	—0.0201	+0.0124	—0.0006	+0.0170	—0.0290	+0.0278	—0.0174	—0.0038	+0.0250	—0.0107	—0.0060
MEANS FOR THE QUARTERS.		29.5788			29.6947			29.5592			29.3843		

A discussion of the above equation, with the object of determining the tropical moments in the annual march of the pressure of dry air, resulted for the maximum July the 28th and for the minimum the 18th of January.

29. Diurnal Fluctuation of Pressure of dry air.

HOUR	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Feb.	Year.
Midnight	29.508	29.631	29.620	29.691	29.720	29.712	29.599	29.592	29.517	29.400	29.368	29.411	29.5641
1 ^h AM	29.503	29.633	29.617	29.685	29.714	29.711	29.600	29.590	29.509	29.394	29.361	29.406	29.5602
2	29.504	29.627	29.616	29.691	29.717	29.709	29.592	29.588	29.504	29.386	29.357	29.401	29.5576
3	29.502	29.621	29.612	29.688	29.711	29.702	29.587	29.588	29.504	29.386	29.354	29.402	29.5548
4	29.507	29.624	29.612	29.686	29.713	29.700	29.591	29.591	29.511	29.396	29.362	29.403	29.5580
5	29.518	29.634	29.615	29.688	29.716	29.708	29.600	29.604	29.523	29.408	29.379	29.417	29.5675
6	29.535	29.642	29.620	29.696	29.724	29.717	29.613	29.612	29.526	29.409	29.385	29.433	29.5760
7	29.544	29.652	29.629	29.705	29.738	29.728	29.615	29.611	29.531	29.412	29.390	29.429	29.5820
8	29.544	29.652	29.633	29.711	29.742	29.731	29.610	29.608	29.541	29.420	29.391	29.431	29.5845
9	29.544	29.647	29.631	29.710	29.741	29.725	29.605	29.604	29.533	29.415	29.385	29.433	29.5810
10	29.537	29.638	29.622	29.703	29.735	29.718	29.599	29.595	29.525	29.412	29.380	29.423	29.5743
11	29.527	29.629	29.614	29.691	29.724	29.708	29.585	29.584	29.513	29.402	29.369	29.414	29.5608
Noon	29.507	29.610	29.593	29.665	29.702	29.692	29.574	29.571	29.506	29.393	29.352	29.403	29.5478
1 ^h PM	29.500	29.592	29.583	29.644	29.686	29.673	29.554	29.556	29.499	29.378	29.345	29.390	29.5334
2	29.484	29.584	29.573	29.641	29.677	29.660	29.540	29.548	29.480	29.368	29.339	29.373	29.5222
3	29.476	29.581	29.572	29.637	29.679	29.660	29.539	29.534	29.470	29.360	29.329	29.361	29.5165
4	29.473	29.582	29.578	29.644	29.682	29.660	29.536	29.540	29.461	29.350	29.321	29.357	29.5157
5	29.475	29.587	29.582	29.653	29.691	29.664	29.542	29.543	29.468	29.346	29.318	29.358	29.5189
6	29.483	29.596	29.594	29.662	29.701	29.677	29.555	29.550	29.487	29.356	29.318	29.368	29.5294
7	29.493	29.610	29.608	29.674	29.713	29.689	29.569	29.569	29.498	29.370	29.342	29.395	29.5433
8	29.510	29.619	29.614	29.685	29.721	29.700	29.579	29.582	29.510	29.388	29.353	29.402	29.5553
9	29.519	29.627	29.620	29.693	29.726	29.707	29.588	29.587	29.518	29.400	29.368	29.411	29.5636
10	29.522	29.632	29.622	29.696	29.729	29.707	29.593	29.590	29.520	29.404	29.370	29.411	29.5663
11	29.521	29.629	29.621	29.699	29.729	29.704	29.589	29.591	29.523	29.402	29.372	29.415	29.5663

The interpolation series for the hourly variation in the gaseous pressure of our atmosphere is for the various months as follows:

$$\begin{aligned}
 \text{For March } P^{(n)} &= 29.5098 + 0.0224 \sin(n15^\circ + 180^\circ 0') + 0.0211 \sin(n30^\circ + 175^\circ 28') \\
 &\quad + 0.0033 \sin(n45^\circ + 354^\circ 17') + \dots \\
 \text{,, April } &= 29.6200 + 0.0247 \sin(n15^\circ + 202^\circ 14') + 0.0180 \sin(n30^\circ + 183^\circ 11') \\
 &\quad + 0.0021 \sin(n45^\circ + 244^\circ 26') + \dots \\
 \text{,, May } &= 29.6083 + 0.0193 \sin(n15^\circ + 215^\circ 41') + 0.0169 \sin(n30^\circ + 180^\circ 34') \\
 &\quad + 0.0030 \sin(n45^\circ + 199^\circ 27') + \dots \\
 \text{,, June } &= 29.6808 + 0.0232 \sin(n15^\circ + 211^\circ 11') + 0.0205 \sin(n30^\circ + 180^\circ 28') \\
 &\quad + 0.0043 \sin(n45^\circ + 201^\circ 36') + \dots \\
 \text{,, July } &= 29.7138 + 0.0169 \sin(n15^\circ + 208^\circ 20') + 0.0203 \sin(n30^\circ + 181^\circ 39') \\
 &\quad + 0.0035 \sin(n45^\circ + 207^\circ 11') + \dots \\
 \text{,, August } &= 29.6984 + 0.0238 \sin(n15^\circ + 202^\circ 15') + 0.0181 \sin(n30^\circ + 175^\circ 30') \\
 &\quad + 0.0030 \sin(n45^\circ + 204^\circ 27') + \dots \\
 \text{,, September } &= 29.5814 + 0.0293 \sin(n15^\circ + 205^\circ 50') + 0.0179 \sin(n30^\circ + 177^\circ 36') \\
 &\quad + 0.0005 \sin(n45^\circ + 288^\circ 26') + \dots
 \end{aligned}$$

$$\begin{aligned}
 \text{For } \textit{October} \quad P^{(n)} &= 29.5803 + 0.0279 \sin(n15^\circ + 203^\circ 35') + 0.0161 \sin(n30^\circ + 181^\circ 11') \\
 &\quad + 0.0022 \sin(n45^\circ + 35^\circ 22') + \dots \\
 \text{,, } \textit{November} &= 29.5076 + 0.0212 \sin(n15^\circ + 196^\circ 56') + 0.0195 \sin(n30^\circ + 171^\circ 38') \\
 &\quad + 0.0037 \sin(n45^\circ + 31^\circ 11') + \dots \\
 \text{,, } \textit{December} &= 29.3898 + 0.0226 \sin(n15^\circ + 190^\circ 49') + 0.0182 \sin(n30^\circ + 160^\circ 59') \\
 &\quad + 0.0052 \sin(n45^\circ + 16^\circ 42') + \dots \\
 \text{,, } \textit{January} &= 29.3591 + 0.0243 \sin(n15^\circ + 190^\circ 5') + 0.0174 \sin(n30^\circ + 166^\circ 42') \\
 &\quad + 0.0065 \sin(n45^\circ + 351^\circ 9') + \dots \\
 \text{,, } \textit{February} &= 29.4017 + 0.0246 \sin(n15^\circ + 191^\circ 55') + 0.0205 \sin(n30^\circ + 169^\circ 12') \\
 &\quad + 0.0035 \sin(n45^\circ + 42^\circ 5') + \dots \\
 \text{,, } \textit{Year} &= 29.5543 + 0.0230 \sin(n15^\circ + 200^\circ 8') + 0.0184 \sin(n30^\circ + 175^\circ 24') \\
 &\quad + 0.0009 \sin(n45^\circ + 337^\circ 44') + \dots
 \end{aligned}$$

Table shewing the Difference between the observed and calculated values of the Diurnal fluctuation of Pressure of Dry Air
(calculated minus observed values).

Hour.	During the years 1858 to 1863												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
Midnight	+0.004	-0.001	0.000	+0.003	+0.003	-0.002	-0.004	-0.002	-0.002	-0.001	+0.001	-0.003	0.0000
1 ^h A. M.	-0.003	-0.006	0.000	+0.006	+0.004	-0.003	-0.007	-0.003	-0.001	-0.002	+0.002	-0.003	-0.0009
2	0.000	-0.002	-0.002	-0.004	-0.004	-0.004	-0.002	-0.001	+0.001	+0.002	+0.002	-0.001	-0.0016
3	-0.001	+0.003	0.000	-0.003	0.000	+0.001	+0.004	+0.002	+0.002	+0.003	+0.007	0.000	+0.0012
4	-0.001	+0.003	0.000	-0.001	-0.001	+0.004	+0.003	+0.004	-0.003	-0.001	+0.008	+0.005	+0.0020
5	-0.001	0.000	0.000	+0.001	+0.001	+0.001	0.000	-0.002	-0.003	-0.005	+0.003	-0.001	-0.0003
6	-0.001	+0.001	+0.001	+0.001	+0.002	-0.001	-0.006	-0.004	+0.002	+0.002	+0.008	-0.008	-0.0007
7	+0.002	-0.002	-0.001	+0.001	-0.002	-0.004	-0.003	0.000	+0.003	+0.004	+0.009	+0.001	-0.0001
8	-0.002	+0.001	-0.001	0.000	0.000	-0.002	+0.003	+0.002	-0.005	-0.003	+0.007	+0.002	+0.0001
9	-0.002	+0.001	0.000	+0.001	+0.001	+0.003	+0.004	0.000	0.000	0.000	+0.005	-0.001	+0.0009
10	+0.001	+0.001	+0.002	-0.001	0.000	+0.003	+0.004	0.000	+0.002	-0.002	-0.001	-0.002	-0.0004
11	-0.002	-0.005	-0.003	-0.005	-0.003	-0.001	0.000	0.000	+0.005	+0.001	-0.003	+0.002	+0.0009
Noon	+0.004	-0.002	+0.003	+0.003	+0.002	-0.002	-0.005	-0.001	0.000	0.000	+0.001	0.000	-0.0003
1 ^h P. M.	+0.001	+0.001	-0.001	+0.006	+0.002	0.000	0.000	+0.001	-0.006	+0.003	-0.003	-0.003	+0.0001
2	-0.004	0.000	0.000	-0.002	+0.001	+0.002	+0.002	-0.002	0.000	0.000	-0.007	-0.001	+0.0002
3	0.000	-0.001	-0.001	-0.001	-0.003	-0.003	-0.003	+0.005	0.000	-0.004	-0.006	0.000	-0.0005
4	+0.003	0.000	-0.002	-0.002	-0.001	0.000	+0.001	-0.002	+0.006	-0.001	-0.005	0.000	-0.0003
5	+0.004	+0.002	+0.003	-0.001	0.000	+0.003	+0.001	0.000	+0.003	+0.003	-0.003	+0.002	+0.0017
6	-0.001	+0.003	+0.002	+0.003	+0.002	+0.001	-0.001	+0.003	-0.006	+0.001	+0.002	+0.003	+0.0009
7	-0.001	0.000	-0.002	+0.003	0.000	-0.001	-0.002	-0.003	-0.002	0.000	-0.010	-0.009	-0.0008
8	+0.003	0.000	0.000	+0.001	0.000	-0.002	0.000	-0.003	0.000	-0.002	-0.006	-0.001	-0.0011
9	+0.001	+0.001	-0.001	-0.001	0.000	-0.003	+0.001	+0.001	+0.002	-0.001	-0.006	+0.001	-0.0003
10	0.000	-0.001	0.000	-0.001	-0.001	+0.002	+0.002	+0.003	+0.004	+0.001	+0.001	+0.005	+0.0016
11	-0.002	+0.003	+0.001	-0.003	-0.003	+0.007	+0.008	+0.002	-0.002	+0.002	+0.002	-0.001	+0.0014

The character of the differences in the above table cannot fail to convince us of the reliability of the proposed formulae, and we have now to examine them with a view of ascertaining the tropical hours throughout the year. The following is the result of such an examination:

MONTHS.	MAXIMUM.				MINIMUM.			
	A.	M.	P.	M.	A.	M.	P.	M.
	Time.	Amount.	Time.	Amount.	Time.	Amount.	Time.	Amount.
March . . .	h. m.	inch.	h. m.	inch.	h. m.	inch.	h. m.	inch.
March . . .	8 7	29.5469	10 6	29.5210	2 14	29.5002	4 7	29.4716
April . . .	7 59	.6531	10 51	.6320	2 36	.6237	3 4	.5800
May . . .	8 21	.6323	10 35	.6222	3 26	.6115	2 48	.5710
June . . .	8 26	.7120	10 49	.6955	3 28	.6838	2 48	.6359
July . . .	8 31	.7431	10 2	.7275	3 15	.7098	2 47	.6762
August . . .	8 25	.7296	11 15	.7107	3 12	.6935	3 8	.6573
September . . .	7 44	.6136	10 56	.5970	2 24	.5901	3 25	.5358
October . . .	7 15	.6109	10 26	.5931	1 37	.5867	3 40	.5371
November . . .	7 57	.5354	10 1	.5240	2 12	.5046	4 0	.4670
December . . .	7 49	.4174	10 22	.4057	2 16	.3874	4 31	.3480
January . . .	7 25	.3906	10 35	.3750	2 20	.3548	4 43	.3184
February . . .	8 9	.4328	10 7	.4175	2 4	.4000	4 4	.3566
Year . . .	8 1	.5845	10 27	.5682	2 30	.5555	3 31	.5144

30. Windrose for pressure of dry air. To determine the influence which various winds exert upon the state of our atmosphere, with special regard to gaseous pressure, a table was compiled quite in accordance with the same principles, as have been already delineated on previous occasions of a similar character. We subjoin here the results of this investigation:

Monthly Means of Pressure of Dry Air for sixteen points of the Compass.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29.5596	29.6770	29.6936	29.8527	29.8331	29.7311	29.6623	29.6370	29.5826	29.4353	29.4266	29.4141
S.S.E.	29.5831	29.6666	29.6731	29.7659	29.7948	29.8132	29.5956	29.6927	29.5871	29.4611	29.4584	29.4507
S.E.	29.6015	29.6893	29.6430	29.8632	29.7567	29.9279	29.6984	29.6817	29.5743	29.4993	29.4017	29.4694
E.S.E.	29.5988	29.6980	29.6933	29.8903	29.8342	30.0228	29.6630	29.6777	29.5624	29.4529	29.3897	29.4772
E.	29.5362	29.7120	29.7272	29.8108	29.8472	29.8179	29.6510	29.6125	29.4790	29.3534	29.3064	29.4685
E.N.E.	29.5361	29.6628	29.6752	29.8609	29.8037	29.7716	29.6855	29.5675	29.5118	29.3229	29.3491	29.3972
N.E.	29.5147	29.6317	29.7097	29.7429	29.7977	29.7635	29.6508	29.5545	29.4421	29.2645	29.3011	29.3695
N.N.E.	29.4565	29.5467	29.5384	29.6539	29.6783	29.7171	29.5682	29.4716	29.4260	29.2908	29.2870	29.3249
N.	29.4489	29.5389	29.4982	29.5897	29.6361	29.6079	29.5287	29.4432	29.4003	29.2392	29.2391	29.3272
N.N.W.	29.4309	29.5426	29.4680	29.5517	29.5834	29.6166	29.5285	29.5114	29.3935	29.2363	29.2359	29.3038
N.W.	29.4762	29.6145	29.6114	29.6080	29.6518	29.6026	29.4778	29.5254	29.4271	29.3315	29.3049	29.3010
W.N.W.	29.4246	29.5861	29.6529	29.6352	29.6536	29.6602	29.5794	29.5296	29.4294	29.3676	29.2690	29.3582
W.	29.4819	29.5937	29.6573	29.6268	29.6658	29.7549	29.5743	29.5481	29.4776	29.3812	29.3039	29.4009
W.S.W.	29.4814	29.6117	29.6684	29.7049	29.7570	29.7048	29.5623	29.5867	29.4824	29.3568	29.2990	29.3809
S.W.	29.4691	29.6472	29.7219	29.7678	29.7695	29.7357	29.5684	29.5653	29.5146	29.4215	29.3215	29.3947
S.S.W.	29.4954	29.6404	29.7254	29.7992	29.8270	29.7898	29.6742	29.6778	29.5836	29.4354	29.4195	29.4011
u =	29.50593	29.62870	29.64731	29.73274	29.74312	29.75220	29.60427	29.58016	29.49680	29.36561	29.33202	29.39020

Retaining the same designations as on former occasions of a similar nature, u—m throughout the year runs thus:

March: — 0.0010 (S.S.W.); April: + 0.0090 (N.W. by W.); May: + 0.0363 (N. N. W.); June: 0.0658 (N. by E.); July: + 0.0471 (N. $\frac{1}{2}$ W.); August: + 0.0322 (N.N.W.); September: + 0.0152 (N.N.W.); October: + 0.0030 (W. by N.); November: — 0.0136 (S.W. by S.); December: — 0.0243 (S.S.W.); January: — 0.0275 (S.S.W.); February: — 0.0160 (S. by W.); year: + 0.0096 (N. W. $\frac{1}{2}$ W.).

For the full understanding of all phenomena connected with this subject it is absolutely necessary to compare these results with those arrived at in par. 12 and 26.

The monthly values have been reduced to quarterly means by the method, explained in the introduction; the following table contains the result:

DIREC- TION OF WIND.	Derived from observations during the years 1858 to 63.														
	AUTUMN.			WINTER.			SPRING.			SUMMER.			YEAR.		
	calculated.	observed.	calculated minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29·6144	29·6365	—0·0221	29·7920	29·7973	—0·0053	29·6296	29·6269	+0·0027	29·4337	29·4235	+0·0102	29·6018	29·6092	—0·0074
S.S.E.	·6363	·6431	— ·0068	·8198	·7919	+ ·0279	·6430	·6360	+ ·0070	·4510	·4591	— ·0081	·6172	·6264	— ·0092
S.E.	·6601	·6558	+ ·0043	·8502	·8423	+ ·0079	·6457	·6444	+ ·0013	·4521	·4552	— ·0031	·6297	·6374	— ·0077
E.S.E.	·6716	·6652	+ ·0064	·8694	·9134	— ·0440	·6360	·6295	+ ·0065	·4323	·4421	— ·0098	·6324	·6367	— ·0043
E.	·6594	·6393	+ ·0201	·8624	·8294	+ ·0330	·6140	·5703	+ ·0437	·3940	·3663	+ ·0277	·6196	·5873	+ ·0323
E.N.E.	·6224	·6206	+ ·0018	·8222	·8235	— ·0013	·5822	·5954	— ·0132	·3470	·3520	— ·0050	·5903	·5962	— ·0059
N.E.	·5716	·6214	— ·0498	·7552	·7659	— ·0107	·5455	·5627	— ·0172	·3046	·3094	— ·0048	·5503	·5779	— ·0276
N.N.E.	·5253	·5106	+ ·0147	·6808	·6831	— ·0023	·5108	·4961	+ ·0147	·2778	·3006	— ·0228	·5107	·5053	+ ·0054
N.	·5002	·4861	+ ·0141	·6224	·6140	+ ·0084	·4846	·4633	+ ·0213	·2713	·2623	+ ·0090	·4828	·4595	+ ·0233
N.N.W.	·5031	·4682	+ ·0349	·5970	·5876	+ ·0094	·4720	·4844	— ·0124	·2820	·2531	+ ·0289	·4738	·4471	+ ·0267
N.W.	·5281	·5645	— ·0364	·6080	·6225	— ·0145	·4745	·4736	+ ·0009	·3023	·3162	— ·0139	·4837	·4955	— ·0118
W.N.W.	·5608	·5729	— ·0121	·6448	·6492	— ·0044	·4908	·5191	— ·0283	·3245	·3304	— ·0059	·5062	·5187	— ·0125
W.	·5868	·5831	+ ·0037	·6896	·6874	+ ·0022	·5170	·5347	— ·0177	·3446	·3611	— ·0165	·5322	·5397	— ·0075
W.S.W.	·5990	·5888	+ ·0102	·7274	·7161	+ ·0113	·5480	·5430	+ ·0050	·3636	·3446	+ ·0190	·5551	·5420	+ ·0131
S.W.	·6010	·5927	+ ·0083	·7530	·7417	+ ·0113	·5795	·5584	+ ·0211	·3846	·3789	+ ·0057	·5727	·5592	+ ·0135
S.S.W.	·6032	·5945	+ ·0087	·7714	·8001	— ·0287	·6076	·6437	— ·0361	·4090	·4202	— ·0112	·5871	·6072	— ·0201
u=		29·5902			29·7416			29·5613			29·3609			29·5591	

Basing upon the above values we derived the interpolation series for each quarter and for the year, expressing the dependency of the gaseous pressure of our atmosphere on the direction of the wind. inch. They are as follows:

$$\begin{aligned}
 \text{for Autumn. } P^{(m)} &= 29\cdot5902 + 0\cdot0677 \sin(m 22^\circ 30' + 57^\circ 33') + 0\cdot0331 \sin(m 45^\circ 0' + 276^\circ 46') + \dots \\
 \text{,, Winter } \dots &= 29\cdot7416 + 0\cdot1211 \sin(m 22^\circ 30' + 44^\circ 28') + 0\cdot0366 \sin(m 45^\circ 0' + 250^\circ 2') + \dots \\
 \text{,, Spring } \dots &= 29\cdot5613 + 0\cdot0872 \sin(m 22^\circ 30' + 56^\circ 13') + 0\cdot0044 \sin(m 45^\circ 0' + 254^\circ 3') + \dots \\
 \text{,, Summer } \dots &= 29\cdot3609 + 0\cdot0849 \sin(m 22^\circ 30' + 73^\circ 5') + 0\cdot0183 \sin(m 45^\circ 0' + 332^\circ 44') + \dots \\
 \text{,, the Year } \dots &= 29\cdot5591 + 0\cdot0738 \sin(m 22^\circ 30' + 53^\circ 42') + 0\cdot0170 \sin(m 45^\circ 0' + 261^\circ 52') + \dots
 \end{aligned}$$

As in former cases, the values for the various directions of the wind have been calculated by these formulae, and were inserted, together with the corresponding differences, beside the values observed.

How well the adopted series answers the purpose may best be judged by the mean errors, the same being for autumn $\pm 0\cdot0159$, for winter $\pm 0\cdot0139$, for spring $\pm 0\cdot0156$, for summer $\pm 0\cdot0126$ and for the year $\pm 0\cdot0143$.

Although we have already seen in which way the gaseous pressure of our atmosphere is influenced by the wind's direction, we subjoin for further illustration also the quarterly differences $u-m$, as derived from the above. They are:

for autumn: $+0.0114$ (N. W. $\frac{1}{2}$ N.); for winter: $+0.0469$ (N. by W.); for spring: $+0.0021$ (W. N. W. $\frac{1}{2}$ W.); for summer: -0.0234 (S. S. W.) and for the year: $+0.0038$ (N. W. $\frac{1}{2}$ W.).

An examination for the purpose of determining the points of maximum and minimum pressure of dry air, and those points in which this meteorological element attains its mean values, resulted thus:

	MAXIMUM.		MINIMUM.		POSITION OF MEAN.
	value	position	value	position	
	inch.		inch.		
Autumn . . .	29.6717	68°17'	29.4980	188°45'	127° 1' and 274°17'
Winter . . .	29.8705	73 59	29.5964	206 24	139 3 „ 303 15
Spring . . .	29.6461	39 9	29.4703	209 34	125 24 „ 301 53
Summer . . .	29.4540	35 18	29.2710	176 10	106 5 „ 289 7
Year . . .	29.6330	61 7	29.4738	201 14	130 16 „ 297 13

All these facts are of the greatest importance when considered in conjunction with those embodied in the chapters on pressure of air and pressure of vapor, we shall have to refrain, however, to enter upon any further inquiry, as such a course would lead too far and would not be compatible with the scope of this work. Suffice it for the present to refer to the „Explanation of Diagrams.“

VI. ATMOSPHERIC ELECTRICITY.

31. Everything bearing reference to the manner, in which the observations on the electrical state of our atmosphere have been made, has already been stated in previous publications on the results of the labours of the Flagstaff Observatory, and we may therefore be permitted simply to refer for particulars to „Results I page 3 and Results II page 6“. Well aware that there are but few complete registers at command, better adapted for examination and discussion, than the one kept during 5 years on atmospheric electrical tension at the observatory, great care was taken to turn these extensive labors to account. If, generally speaking, the greatest interest is to be attached to information on an element of so intricate a nature, it must be especially so in this case where the observations have been collected in the southern hemisphere, in a part of the globe from which we possess as yet but very little calculated to assist this particular branch of scientific inquiry. In order to do justice to so elaborate a task, it was considered expedient, to treat this subject in two separate sections. Positive electrical tension, being regarded as implying the normal condition of our atmosphere, with regard to the matter in question, naturally requires to be taken first into consideration, while the exceptional case of negative tension may be considered in the second section.

As mentioned in the volumes, above referred to, the registrations were effected by the aid of Quetelet's Electrometer which certainly offers one of the best means for testing the electricity

of air, both for quality and tension, but with respect to the latter it is to be regretted that the parts of division of the instrument have hitherto not proved referrible to an absolute value. This, however, is a drawback, which it has in common with nearly every apparatus for the registration of hourly observations on atmospheric electricity, and the construction of an instrument, totally answering the purpose, is a problem yet to be solved. In case it be accomplished, there could not exist any serious difficulty in referring the results obtained by the aid of our instrument, at least approximately to some absolute measure. This applies to tensions from 1 to 10; those beyond that limit, though frequently occurring, are not measurable, and are indicated in the registers by the sign „ ∞ “. In such cases vivid sparks could be obtained from the instrument. It appeared desirable that they did not get lost for the discussion and were consequently taken as being equal to 10 of the division. Tensions between 0 and 1 were equally difficult to be measured by the electrometer in use, as an indifferent degree of insolation frequently interfered with observations of so delicate a nature. Notwithstanding these deficiencies, we feel convinced that the extensive set of observations, forming the base of the present discussions, will materially assist the advancement of this special branch of meteorological science.

POSITIVE ELECTRICAL TENSION.

32. Annual march of positive electrical tension. Prior to entering upon a delineation of the fluctuations of atmospheric electricity in the course of the year, a few facts, illustrative of the change of this element during the five years of observation, will be received with satisfaction. The following little table contains the leading features.

PERIODS.	Mean electrical tension.				
	1858—59.	1859—60.	1860—61.	1861—62.	1862.
	parts.	parts.	parts.	parts.	parts.
Autumn	2·87	2·91	2·42	1·85	2·56
Winter	2·86	3·86	4·49	3·85	2·84
Spring	2·79	3·42	2·73	3·36	·
Summer	2·84	2·45	1·76	2·91	·
Year	2·84	3·16	2·85	2·99	·

The oscillations in the mean values for the years are but slight, the amplitude amounting to 0·32 parts of division. The deviations of the several yearly means from the mean value for the whole period (4 years) are consecutively: — 0·07, + 0·25, — 0·06, + 0·08, resulting a probable deviation from the true mean of $\pm 0·115$, which value would be considerably lessened by the omission of the mean for 1862, evidently very abnormal. Under the supposition, that the positive electrical tension is not subjected to a considerable secular change, the constant character of the yearly mean, in conjunction with the annual and diurnal fluctuations, would afford a means of comparing the parts of division of Quetelet's electrometer with the division of any absolutely measuring instrument, yet to be constructed.

After these few introductory remarks we subject now the annual variation of atmospheric electricity to a close examination.

ANNUAL MARCH OF POSITIVE ELECTRICITY.

(Mean for the year: 2.908).

1858—63		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.
		parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.
1 st		2.19	2.48	1.83	3.31	3.87	4.75	3.81	3.17	2.08	2.37	2.60	2.40
2 ^d		2.27	2.42	2.87	3.49	3.34	3.98	3.11	3.04	2.44	2.10	2.09	3.02
3 ^d		2.28	2.45	2.39	4.41	2.98	4.61	3.59	3.75	2.61	2.09	2.09	1.76
4 th		1.67	2.06	1.75	4.16	2.24	5.18	3.73	3.77	3.09	2.98	2.72	2.05
5 th		1.55	1.51	2.47	4.85	2.76	4.16	3.57	3.24	2.28	2.78	3.96	1.62
6 th		2.64	2.04	2.91	4.40	2.76	4.19	3.21	3.22	3.08	2.99	2.91	1.73
7 th		2.67	2.39	3.22	3.78	3.70	4.69	2.79	2.76	2.96	2.62	2.55	2.41
8 th		2.10	2.77	2.49	3.51	2.68	4.78	3.08	2.25	2.69	2.92	2.43	1.99
9 th		2.31	2.76	3.00	2.07	1.44	3.39	3.15	3.49	2.95	2.48	2.97	2.11
10 th		1.85	2.25	3.41	2.31	2.79	3.37	3.96	2.65	2.61	1.86	2.14	2.12
11 th		1.51	1.87	2.72	2.41	3.51	3.79	3.24	2.69	2.32	2.21	1.91	1.80
12 th		1.48	2.11	2.02	2.26	2.98	3.60	3.52	3.14	3.35	1.96	2.30	1.68
13 th		1.58	2.87	2.23	3.34	4.02	3.19	3.24	3.02	3.14	2.68	2.60	2.47
14 th		2.05	2.16	2.29	3.55	2.92	3.19	2.75	2.71	3.42	2.75	2.54	2.43
15 th		2.19	1.87	2.92	5.23	3.54	3.24	3.19	3.00	3.08	2.71	2.19	2.05
16 th		2.31	2.30	3.50	4.74	3.57	3.38	3.01	3.44	3.01	2.31	2.21	2.42
17 th		2.57	2.96	3.46	4.90	3.65	4.31	2.92	4.02	2.51	2.71	2.40	2.46
18 th		2.34	2.85	4.20	3.70	4.16	3.48	2.89	3.87	2.67	2.98	2.41	2.30
19 th		1.76	2.76	3.48	2.15	5.52	3.43	3.10	2.72	2.20	2.65	2.42	2.86
20 th		1.96	3.22	3.34	2.51	5.19	3.18	3.60	2.97	2.28	3.32	2.60	2.90
21 st		2.35	3.26	2.68	2.69	3.79	2.49	3.71	3.09	2.46	2.67	1.96	2.78
22 ^d		2.71	3.71	2.63	3.73	2.80	2.45	3.46	3.20	1.34	2.68	2.75	2.97
23 ^d		2.78	2.87	2.66	4.62	3.33	2.31	3.68	3.44	1.80	2.86	2.72	3.30
24 th		2.44	2.85	3.37	3.68	3.09	2.94	3.65	2.99	2.44	2.90	2.41	2.27
25 th		1.93	3.43	3.14	3.36	3.65	3.85	3.49	3.20	2.28	2.45	2.92	2.16
26 th		2.41	3.14	2.51	3.11	3.65	3.72	3.32	3.19	2.64	1.76	2.85	2.07
27 th		2.74	2.87	3.04	2.51	3.67	3.05	3.86	3.65	2.56	2.47	3.33	2.29
28 th		2.22	2.66	2.61	3.74	4.13	3.82	4.25	3.19	2.83	3.23	2.81	2.29
29 th		2.68	2.12	2.52	3.96	5.07	4.17	3.93	3.35	2.51	3.12	2.21	
30 th		2.42	1.88	2.65	3.11	3.95	4.18	3.22	1.99	2.21	2.45	2.33	
31 st		2.70		2.50		4.22	3.13		2.56		2.37	2.32	
MEANS.	observed	2.21	2.56	2.80	3.52	3.51	3.68	3.40	3.12	2.59	2.59	2.54	2.31
	calculated	2.16	2.46	2.96	3.46	3.60	3.63	3.38	3.05	2.68	2.63	2.52	2.35
	calc. — observ.	—0.05	—0.10	+0.16	—0.06	+0.08	—0.04	—0.02	—0.07	+0.09	+0.03	—0.02	+0.04
MEANS FOR THE QUARTERS.		2.526			3.573			3.040			2.487		

By the aid of the monthly mean values, resulting from the above table, we derived the interpolation series expressing the annual march of positive atmospheric electricity. It is as follows:

$$E^{(n)} = 2.908 + 0.667 \sin \left\{ \left(n + \frac{1}{2} \right) 30^\circ + 201^\circ 9' \right\} + 0.151 \sin \left\{ \left(n + \frac{1}{2} \right) 60^\circ + 355^\circ 26' \right\} \\ + 0.073 \sin \left\{ \left(n + \frac{1}{2} \right) 90^\circ + 297^\circ 48' \right\} + \dots$$

The reliability of the proposed equation was tested by the results of a computation of the monthly means; and the differences between both, the computed and the observed values, are trifling, the mean error amounting to only ± 0.063 pts of division.

A discussion of this series, for the purpose of finding the tropical moments in the annual variation, yields for the maximum the 29.4th of July, for the minimum the 6.1th of March. By the above table we see that the maximum happens to occur on the 19th of July, and that the minimum takes place on the 22^d of November; with regard to the latter it is sufficient to point out, that this minimum value stands rather isolated, while all values of the period from the 4th to the 13th of March are very low. The „five day means“ tend to corroborate the evidence already adduced. The table below shows the 3^d period in March (12th to 16th) to be a minimum penthemeral mean; but the mean of the first three periods of this month, being less than that for any other three consecutive periods, proves the minimum to occur on the 8th or 9th, consequently near the day pointed out by our formula. The 1st period in August (4th — 8th) is the maximum for the year, but considering that the mean for the period from the 25th of July to the 8th of August is the highest of any three consecutive periods throughout the year, we place the maximum on or about the first of August, which again accords with the above series.

Mean „Five day Means“ in Positive Electrical Tension for the years 1858 to 1863.

NUMBER OF THE PERIOD in the resp. MONTHS.	Jan. (1—5)	Febr. (31—4)	March. (2—6)	April. (1—5)	May. (1—5)	June. (31—4)	July. (5—9)	Aug. (4—8)	Sept. (3—7)	Octbr. (3—7)	Nov. (2—6)	Dec. (2—6)
	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.
1	2.691	2.695	2.081	2.224	1.846	3.577	2.593	4.601	3.376	3.350	2.700	2.589
2	2.602	1.960	2.087	2.472	3.004	3.724	2.883	3.467	3.342	2.843	2.705	2.418
3	2.308	2.101	1.924	2.120	2.436	2.776	4.088	3.521	3.022	3.239	3.203	2.483
4	2.409	2.418	2.204	2.860	3.596	4.148	3.660	2.773	3.280	3.199	2.425	2.866
5	2.553	2.845	2.455	3.164	2.893	3.448	4.032	3.478	3.602	3.295	2.101	2.534
6	2.706	2.187	2.552	2.536	2.665	3.459	4.311	3.680	3.524	2.634	2.497	2.729
						3.108						

33. Diurnal fluctuation in positive atmospheric electricity. Tables bearing on this topic have already been published in „R. I. pag. 59 and R. II. pag. 109“; additional materials are to be found in appendix Nr. 15. From these various tables resulted the one in this paragraph.

Diurnal Fluctuation of Positive Atmospheric Electricity.

HOUR	During the years 1858 to 1863.											
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.
Midnight	parts. 2.263	parts. 2.673	parts. 2.676	parts. 3.142	parts. 3.202	parts. 3.180	parts. 3.580	parts. 3.533	parts. 2.915	parts. 2.729	parts. 2.687	parts. 2.848
1 ^h AM	2.090	2.266	2.346	2.863	3.108	2.755	3.353	3.316	2.516	2.583	2.589	2.571
2	2.038	2.178	2.170	2.517	2.782	2.575	3.028	3.108	2.356	2.336	2.327	2.376
3	2.095	2.266	2.099	2.474	2.697	2.557	3.193	3.232	2.486	2.381	2.525	2.315
4	2.248	2.265	2.299	2.555	2.888	2.513	3.140	3.118	2.487	2.436	2.396	2.392
5	2.093	2.153	2.274	2.637	3.050	2.839	3.308	3.278	2.897	2.888	2.716	2.416
6	2.760	2.777	2.660	3.039	3.350	3.554	4.178	4.185	3.673	3.432	3.680	2.836
7	3.345	3.921	3.423	4.031	4.232	4.667	5.518	4.817	3.525	3.735	3.811	2.738
8	3.335	4.579	4.515	5.130	5.268	5.575	5.095	4.461	3.208	3.384	3.506	3.312
9	2.198	3.544	3.563	4.959	5.293	4.704	3.695	2.873	2.233	2.444	2.612	2.250
10	1.780	2.609	2.880	4.467	4.786	3.795	3.285	2.184	1.844	1.821	2.207	1.710
11	1.340	2.027	2.501	3.824	3.855	3.170	2.853	1.985	1.749	1.888	2.015	1.426
Noon	1.720	1.771	2.360	3.172	3.424	2.736	2.520	2.095	1.701	1.830	1.832	1.302
1 ^h PM	1.228	1.796	2.076	3.066	2.908	2.384	2.145	1.683	1.248	1.390	1.759	1.187
2	1.175	1.352	2.000	2.576	2.834	2.359	2.510	1.821	1.686	1.685	1.710	1.110
3	1.143	1.581	2.190	2.641	2.691	2.502	2.023	1.453	1.095	1.457	1.336	1.087
4	1.595	1.773	2.606	3.176	3.283	2.935	2.478	1.974	1.554	1.781	1.701	1.139
5	1.723	2.473	3.167	3.720	3.780	3.858	3.138	2.071	1.884	1.901	1.961	1.365
6	2.058	2.839	3.507	4.641	4.498	4.467	3.660	3.031	1.352	2.288	2.179	1.402
7	2.845	3.430	3.158	4.195	4.601	5.011	4.410	3.848	3.108	2.780	2.610	1.937
8	2.990	3.275	3.292	4.261	4.282	4.755	4.793	4.125	3.631	3.128	2.861	2.704
9	3.090	3.190	3.340	3.883	4.184	4.423	4.655	3.885	3.795	3.283	3.296	3.006
10	2.900	3.417	3.249	3.716	3.844	4.287	4.213	4.061	3.982	3.325	3.016	3.121
11	2.845	3.066	2.907	3.427	3.800	3.849	3.873	3.789	3.587	3.143	2.918	2.895

By Bessel's interpolation formula we derived the following series, determining the law of diurnal fluctuation for positive atmospheric electricity.

$$\begin{aligned}
 \text{For March} \quad E^{(n)} &= 2.204 + 0.5299 \sin(n15^\circ + 250^\circ 8') + 0.6852 \sin(n30^\circ + 210^\circ 9') \\
 &\quad + 0.1760 \sin(n45^\circ + 341^\circ 13') + \dots \\
 \text{" April} \quad &= 2.634 + 0.3824 \sin(n15^\circ + 247^\circ 51') + 0.8952 \sin(n30^\circ + 209^\circ 30') \\
 &\quad + 0.2673 \sin(n45^\circ + 282^\circ 36') + \dots \\
 \text{" May} \quad &= 2.802 + 0.0624 \sin(n15^\circ + 346^\circ 53') + 0.7442 \sin(n30^\circ + 208^\circ 12') \\
 &\quad + 0.2954 \sin(n45^\circ + 251^\circ 55') + \dots \\
 \text{" June} \quad &= 3.426 + 0.2970 \sin(n15^\circ + 63^\circ 52') + 0.9743 \sin(n30^\circ + 197^\circ 19') \\
 &\quad + 0.3920 \sin(n45^\circ + 212^\circ 41') + \dots \\
 \text{" July} \quad &= 3.693 + 0.2125 \sin(n15^\circ + 78^\circ 41') + 0.9853 \sin(n30^\circ + 193^\circ 9') \\
 &\quad + 0.3695 \sin(n45^\circ + 211^\circ 15') + \dots \\
 \text{" August} \quad &= 3.560 + 0.1343 \sin(n15^\circ + 303^\circ 6') + 0.2751 \sin(n30^\circ + 204^\circ 9') \\
 &\quad + 0.2114 \sin(n45^\circ + 248^\circ 30') + \dots \\
 \text{" September} \quad &= 3.527 + 0.5371 \sin(n15^\circ + 246^\circ 30') + 1.0577 \sin(n30^\circ + 211^\circ 1') \\
 &\quad + 0.1745 \sin(n45^\circ + 317^\circ 19') + \dots \\
 \text{" October} \quad &= 3.080 + 0.9162 \sin(n15^\circ + 244^\circ 35') + 0.8348 \sin(n30^\circ + 214^\circ 16') \\
 &\quad + 0.2517 \sin(n45^\circ + 341^\circ 52') + \dots
 \end{aligned}$$

$$\begin{aligned}
 \text{For November } E^{(n)} &= 2.563 + 0.8778 \sin(n15^\circ + 251^\circ 52') + 0.7922 \sin(n30^\circ + 211^\circ 9') \\
 &\quad + 0.4451 \sin(n45^\circ + 4^\circ 50') + \dots \\
 \text{,, December} &= 2.502 + 0.6180 \sin(n15^\circ + 242^\circ 32') + 0.5959 \sin(n30^\circ + 209^\circ 35') \\
 &\quad + 0.2892 \sin(n45^\circ + 344^\circ 17') + \dots \\
 \text{,, January} &= 2.510 + 0.5765 \sin(n15^\circ + 226^\circ 10') + 0.5952 \sin(n30^\circ + 209^\circ 37') \\
 &\quad + 0.2458 \sin(n45^\circ + 339^\circ 21') + \dots \\
 \text{,, February} &= 2.185 + 0.8190 \sin(n15^\circ + 238^\circ 44') + 0.4976 \sin(n30^\circ + 189^\circ 56') \\
 &\quad + 0.2441 \sin(n45^\circ + 333^\circ 0') + \dots \\
 \text{,, Year} &= 2.891 + 0.3877 \sin(n15^\circ + 244^\circ 49') + 0.8221 \sin(n30^\circ + 205^\circ 35') \\
 &\quad + 0.1573 \sin(n45^\circ + 295^\circ 45') + \dots
 \end{aligned}$$

Table shewing the Difference between the observed and calculated values of the Diurnal fluctuation of Positive Atmospheric Elec'ricity.
(calculated minus observed values).

HOUR	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year
Midnight	parts. +0.16	parts. +0.13	parts. +0.06	parts. -0.06	parts. +0.25	parts. +0.17	parts. +0.01	parts. -0.01	parts. +0.03	parts. +0.11	parts. +0.04	parts. +0.05	parts. +0.077
1h AM	-0.03	+0.11	+0.08	-0.06	+0.06	+0.06	-0.23	-0.20	-0.11	-0.13	-0.18	0.00	-0.049
2	-0.18	-0.12	-0.04	-0.01	+0.09	-0.14	-0.16	-0.19	-0.17	-0.10	-0.09	-0.07	-0.094
3	-0.16	-0.20	-0.12	-0.17	-0.06	-0.21	-0.23	-0.20	-0.12	-0.06	-0.17	-0.05	-0.160
4	-0.04	-0.04	-0.22	-0.24	-0.25	+0.09	+0.19	+0.27	+0.38	+0.20	+0.27	+0.02	+0.041
5	+0.49	+0.56	+0.19	0.00	-0.10	+0.36	+0.58	+0.56	+0.50	+0.17	+0.38	+0.26	+0.314
6	+0.13	+0.49	+0.34	+0.22	+0.20	+0.38	+0.24	0.00	+0.01	-0.07	-0.25	+0.08	+0.135
7	-0.34	-0.24	+0.08	-0.02	+0.05	-0.10	-0.81	-0.60	+0.07	-0.34	-0.29	+0.22	-0.194
8	-0.47	-0.85	-0.75	-0.52	-0.38	-0.66	-0.44	-0.54	-0.08	-0.23	-0.17	-0.53	-0.461
9	+0.28	-0.14	+0.11	-0.10	-0.16	+0.08	+0.54	+0.48	+0.27	+0.25	+0.31	+0.15	+0.189
10	+0.25	+0.18	+0.36	+0.12	+0.10	+0.47	+0.31	+0.50	+0.07	+0.37	+0.21	+0.24	+0.286
11	+0.27	+0.08	+0.16	+0.12	+0.41	+0.31	+0.07	+0.12	-0.24	-0.10	-0.02	+0.12	+0.124
Noon	-0.42	-0.19	-0.20	+0.03	+0.07	-0.01	-0.15	-0.31	-0.34	-0.25	-0.12	-0.02	-0.162
1h PM	-0.07	-0.46	-0.17	-0.45	-0.04	-0.13	-0.06	-0.14	+0.08	+0.14	-0.17	-0.04	-0.129
2	-0.01	+0.07	-0.01	-0.13	-0.20	-0.21	-0.44	-0.23	-0.12	-0.12	-0.13	0.00	-0.149
3	+0.15	+0.15	+0.11	+0.06	+0.13	-0.05	+0.27	+0.30	+0.30	+0.18	+0.29	+0.03	+0.166
4	-0.08	+0.37	+0.13	+0.05	+0.02	+0.09	+0.23	+0.08	-0.06	-0.02	+0.05	+0.05	+0.084
5	+0.10	+0.06	-0.07	+0.08	+0.07	-0.20	+0.07	+0.37	-0.12	+0.04	-0.04	-0.02	+0.043
6	+0.13	+0.03	-0.21	-0.46	-0.23	-0.24	+0.08	-0.11	+0.91	-0.07	-0.01	+0.22	+0.019
7	-0.26	-0.31	+0.20	+0.10	-0.16	-0.40	-0.20	-0.41	-0.20	-0.15	-0.09	+0.10	-0.142
8	-0.07	+0.04	+0.03	-0.11	+0.09	0.00	-0.26	-0.22	-0.06	-0.08	+0.02	-0.18	-0.073
9	+0.03	+0.23	-0.09	0.00	-0.01	+0.24	0.00	+0.31	+0.19	+0.07	-0.16	-0.07	+0.042
10	+0.15	-0.05	-0.11	-0.13	+0.09	+0.07	+0.28	+0.14	-0.01	+0.09	+0.18	+0.05	+0.051
11	-0.05	+0.10	+0.07	-0.09	-0.10	+0.05	+0.23	+0.15	-0.02	+0.07	+0.11	+0.26	+0.056

The accordance of the observed and calculated values having been proved by the smallness of the above differences and the changing character of their algebraic signs, we may now proceed with the results of the discussion of the above interpolation series, carried out for the determination of the tropical hours and their respective values.

Tropical hours and corresponding Maxima and Minima in positive Atmospheric Electricity.

MONTHS.	MAXIMUM.				MINIMUM.			
	A.		P.		A.		P.	
	Time.	Amount.	Time.	Amount.	Time.	Amount.	Time.	Amount.
	h. m.	parts.	h. m.	parts.	h. m.	parts.	h. m.	parts.
March . . .	6 55	3·002	9 18	3·110	2 16	1·864	1 28	1·144
April . . .	7 39	3·762	9 16	3·421	2 45	1·972	1 14	1·331
May . . .	8 14	3·777	6 59	3·362	3 8	1·977	1 15	1·897
June . . .	8 57	4·835	6 53	4·286	3 26	2·267	1 53	2·439
July . . .	9 0	5·130	7 10	4·445	3 32	2·608	2 2	2·635
August . . .	8 15	4·920	8 6	4·752	2 46	2·330	1 43	2·135
September . .	7 20	4·727	8 56	4·638	2 18	2·860	1 32	2·037
October . .	6 37	4·248	9 32	4·233	2 9	2·918	1 18	1·532
November . .	6 16	3·704	9 30	4·051	2 1	2·186	12 45	1·331
December . .	6 38	3·421	9 45	3·423	2 14	2·236	12 56	1·526
January . .	6 49	3·531	9 46	3·228	2 8	2·243	1 34	1·578
February . .	6 44	2·975	10 24	3·199	2 46	2·252	2 9	1·116
Year . . .	7 37	3·844	9 9	3·714	2 36	2·343	1 36	1·736

The diurnal oscillations in electrical tension exhibit two maxima and two minima, and bear great similarity to the diurnal variations in pressure of air. Both curves resemble each other even in this respect, that for the greater part of the year the first maximum exceeds the second, and the minimum in the afternoon descends below the one in the forenoon. The shifting of the tropical hours in the course of the year shows also in both cases considerable conformity, at least as far as the first maximum and minimum are concerned; with respect to the second maximum and minimum there exist deviations which may best be studied by an examination of the respective diagrams. In one respect, however, the diurnal curves for pressure of air and electrical tension are dissimilar viz: the daily amplitude is in the first case larger in summer, decreasing towards winter, while in the latter case we notice the reverse to be the law.

34. Windrose of positive electrical tension. The tables shewing the mean electrical tension for every point of the compass, during each of the several years of observation, are partly published in „R. I pag. 67“, partly they are contained in appendix Nr. 16 of this volume. The general mean for the period from April 1858 to September 1862, both inclusive, have been embodied in the first table of appendix 16, and from it was derived the annexed table by reducing the number of points to sixteen.

Monthly Means of Positive Atmospheric Electricity for sixteen points of the Compass.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	Septbr.	Octbr.	Novbr.	Decbr.	Jan.	Febr.
	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.
S.	2.037	2.016	3.371	4.385	4.963	3.992	3.668	2.781	2.248	2.296	2.338	1.873
S.S.E.	2.714	2.943	3.686	4.935	5.068	5.095	4.312	3.663	3.128	3.119	2.988	2.412
S.E.	2.939	3.264	3.108	4.963	5.508	5.253	4.822	4.688	3.571	3.487	3.394	2.822
E.S.E.	2.861	3.396	3.510	4.686	6.257	6.290	4.655	5.361	3.818	3.676	3.068	2.617
E.	2.509	3.148	3.438	5.180	6.910	5.767	5.755	5.223	3.841	3.271	3.306	3.183
E.N.E.	2.637	3.068	3.699	5.634	6.177	5.085	6.156	4.068	3.750	2.847	2.980	3.305
N.E.	2.610	3.136	3.178	4.701	5.553	4.692	4.274	3.660	2.671	2.740	2.659	2.656
N.N.E.	1.961	2.318	2.249	2.965	2.992	3.077	3.073	3.105	2.099	2.252	1.800	2.428
N.	1.799	2.099	2.381	2.318	2.331	2.775	2.872	2.787	1.763	1.937	2.494	1.910
N.N.W.	1.917	1.911	2.814	2.887	3.062	3.305	3.255	3.057	1.970	2.270	2.320	1.950
N.W.	2.118	2.508	2.876	3.100	2.578	3.077	2.983	3.188	2.101	2.456	2.407	2.015
W.N.W.	1.719	2.368	2.366	3.111	2.804	2.796	2.414	3.223	2.428	2.257	2.024	1.829
W.	1.669	2.275	2.388	2.617	2.337	2.801	2.947	2.944	2.020	2.342	2.315	2.307
W.S.W.	1.840	2.176	2.562	2.281	2.651	2.943	2.356	2.675	2.216	2.691	2.590	2.719
S.W.	2.032	2.587	2.758	3.951	3.598	3.690	3.315	2.826	2.631	2.867	2.734	2.622
S.S.W.	1.899	2.149	3.343	4.386	5.259	4.364	3.612	2.545	2.489	2.277	2.428	1.856
u =	2.2038	2.5851	2.9829	3.9137	4.2530	4.0626	3.7793	3.4871	2.6715	2.6740	2.6153	2.4065

u is simply the arithmetical mean for every one of the above monthly columns, m signifies the true monthly mean; u—m expresses, analogically with cases of a similar nature, the influence of the mean direction of the wind upon the electrical tension. For the various months we obtained the following results:

March: —0.01 (S.S.W.); April: + 0.02 (N.W. by W.); May: + 0.18 (N.N.W.); June: + 0.39 (N. by E.); July: + 0.74 (N. $\frac{1}{2}$ W.); August: + 0.38 (N.N.W.); September: + 0.38 (N.N.W.); October: + 0.37 (W. by N.); November: + 0.08 (S.W. by S.); December: + 0.08 (S.S.W.); January: + 0.07 (S.S.W.); February: + 0.10 (S. by W.); year: + 0.228 (N.W. $\frac{1}{2}$ W.)

This series tells us that all winds cause the electrical tension to decrease, for the month of March cannot be considered, as forming in reality an exception, in as much as the result for this month is derived from four year's observations only; but we glean from the above also, that this depression in tension becomes the greater, the more the wind's direction approaches to the North. What we just pointed out, is still better illustrated by the following table, containing quarterly values, instead of monthly ones, as above. The method applied in the reduction, which became necessary in consequence of the unequal number of observation, is identical with that explained in the introduction.

Windrose for Positive Electrical Tension.

DIREC- TION OF WIND.	Derived from observations during the years 1858 to 63.														
	AUTUMN			WINTER			SPRING			SUMMER			YEAR		
	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed	calculat.	observed	calculat. minus observed
	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.
S.	2.550	2.307	+ 0.243	4.486	4.390	+ 0.096	3.043	2.834	+ 0.209	2.485	2.171	+ 0.314	2.994	2.790	+ 0.204
S.S.E.	2.863	3.048	- .185	5.079	5.022	+ .057	3.645	3.662	- .017	2.717	2.846	- .129	3.373	3.496	- .123
S.E.	3.144	3.169	- .025	5.606	5.258	+ .348	4.289	4.307	- .018	3.002	3.218	- .216	3.819	3.880	- .061
E.S.E.	3.279	3.256	+ .023	5.888	5.751	+ .137	4.722	4.537	+ .185	3.204	3.074	+ .130	4.153	3.941	+ .212
E.	3.209	3.009	+ .200	5.788	5.982	- .194	4.758	4.795	- .037	3.212	3.235	- .023	4.211	4.173	+ .038
E.N.E.	2.965	3.100	- .135	5.289	5.575	- .286	4.376	4.770	- .394	2.996	2.984	+ .012	3.937	4.153	- .216
N.E.	2.647	2.912	- .265	4.509	4.920	- .411	4.736	3.632	+ .104	2.635	2.675	- .040	3.419	3.683	- .264
N.N.E.	2.375	2.107	+ .268	3.668	3.015	+ .653	3.091	2.774	+ .316	2.274	2.118	+ .156	2.848	2.463	+ .385
N.	2.228	2.093	+ .135	2.986	2.462	+ .524	2.655	2.519	+ .136	2.051	2.090	- .039	2.422	2.144	+ .278
N.N.W.	2.209	2.292	- 0.83	2.601	3.074	- .473	2.513	2.841	- .328	2.027	2.176	- .149	2.255	2.578	- .323
N.W.	2.258	2.555	- .277	2.528	2.901	- .373	2.585	2.762	- .177	2.160	2.308	- .148	2.325	2.580	- .255
W.N.W.	2.295	2.151	+ .144	2.678	2.879	- .201	2.706	2.564	+ .142	2.340	2.038	+ .302	2.509	2.407	+ .102
W.	2.277	2.126	+ .151	2.936	2.581	+ .355	2.736	2.639	+ .097	2.456	2.300	+ .156	2.669	2.370	+ .299
W.S.W.	2.227	2.201	+ .026	3.227	2.657	+ .570	2.658	2.369	+ .289	2.464	2.646	- .182	2.731	2.738	- .007
S.W.	2.215	2.453	- .238	3.553	3.690	- .137	2.582	2.935	- .353	2.407	2.737	- .330	2.733	2.961	- .228
S.S.W.	2.315	2.293	+ .022	3.962	4.632	- .670	2.674	2.823	- .149	2.386	2.204	+ .182	2.786	2.835	- .049
u =		2.566			4.049			3.298			2.551			3.075	

Applying to these values the method of the least squares we receive the interpolation series for each quarter and for the year:

$$\begin{aligned}
 \text{for Autumn} \dots E^{(m)} &= 2.566 + 0.493 \sin(m 22^\circ 30' + 19^\circ 4') + 0.233 \sin(m 45^\circ 0' + 307^\circ 20') + \dots \\
 \text{,, Winter} \dots &= 4.049 + 1.612 \sin(m 22^\circ 30' + 27^\circ 44') + 0.314 \sin(m 45^\circ 0' + 273^\circ 17') + \dots \\
 \text{,, Spring} \dots &= 3.298 + 1.029 \sin(m 22^\circ 30' + 10^\circ 52') + 0.470 \sin(m 45^\circ 0' + 287^\circ 12') + \dots \\
 \text{,, Summer} \dots &= 2.551 + 0.436 \sin(m 22^\circ 30' + 29^\circ 52') + 0.285 \sin(m 45^\circ 0' + 276^\circ 3') + \dots \\
 \text{,, Year} \dots &= 3.074 + 0.822 \sin(m 22^\circ 30' + 20^\circ 21') + 0.366 \sin(m 45^\circ 0' + 269^\circ 41') + \dots
 \end{aligned}$$

Beside the observed values in the above table stand the values computed by the proposed formulae, and we rightly conclude from the differences between both, that the equations well accord with actual observation, the mean error for the various seasons, commencing with autumn, being: ± 0.1512 , ± 0.3428 , ± 0.1844 , ± 0.1568 and for the year ± 0.1902 part of division.

The differences $u-m$ are as follows: for Autumn: $+ 0.040$ (N.W. $\frac{1}{2}$ N.); Winter: $+ 0.476$ (N. by W.); Spring: $+ 0.258$ (W.N.W. $\frac{1}{2}$ W.); Summer: $+ 0.064$ (S.S.W.); and for the Year: $+ 0.167$ (N.W. $\frac{1}{2}$ W.).

In autumn this influence on the electrical tension seems to be least; but this result ought to be received with caution, as it was derived from four years only as far as the month of March is concerned, this month being moreover of a very undecided character. A greater number of years would most probably cause $u-m$ to be nearly alike for autumn and spring. The electrical windrose resembles in the whole that for pressure of air, a coincidence which is the more replete with interest, as we have already noticed a similar fact when speaking of the diurnal variation. The subjoined table, showing the tropical points, illustrates this still further.

	MAXIMUM.		MINIMUM.		POSITIONS OF THE MEAN.
	value.	position.	value.	position.	
	parts.	° ' "	parts.	° ' "	
Autumn . .	3·282	71 6	2·183	193 30	1°12' and 140°55'
Winter . .	5·902	73 25	2·522	219 36	341 36 „ 147 9
Spring . .	4·797	80 36	2·512	203 18	10 18 „ 179 41
Summer . .	3·237	79 42	2·013	193 49	7 39 „ 139 54
Year . .	4·229	82 47	2·252	205 46	5 35 „ 148 16

In the last column we find those points in which the electrical tension attains a mean value.

The range of the electrical tension within the compass of the windrose is least in autumn, greatest in winter; spring and summer having an intermediate value.

35. Positive electrical tension during calms. The total number of observations from which we derived the results, contained in the little table, amounts to 1484.

1858—63.	Mean Elect. minus Electricity in Calms.	Mean Electricity in Calms.	1858—63.	Mean Elect. minus Electricity in Calms.	Mean Electricity in Calms.
	parts.	parts.		parts.	parts.
March . . .	+0·53	2 74	June . . .	—2·00	5·52
April . . .	—0·77	3·33	July . . .	—4·53	7·04
May . . .	—0·91	3·71	August . .	—2·30	5·98
Autumn . .	—0·788	3·31	Winter . .	—2·694	6·27
September .	—2·62	6·02	December .	—0·29	2·88
October . .	—1·14	4·26	January . .	—0·54	3·09
November .	—1·05	3·64	February . .	—0·55	2·87
Spring . . .	—1·419	4·50	Summer . .	—0·438	2·92
Year . . .	—1·639	4·547			

With the only exception of the month of March the electrical tension seems to increase during calms, the excess above the mean reaching its maximum value in the wintermonths, in July even as much as 4·53 parts of division. In December the difference attains a minimum, if we disregard that in March the electrical tension during calms is lower, by the above table, than the general mean. Whether the irregularity in March is due to an actual depression of the tension during calms, or whether it originates, as already suggested when speaking of the wind's influence on the tension in March, from an insufficient number of observations, would be rather premature to decide, and must be the subject of future inquiry.

NEGATIVE ELECTRICAL TENSION.

36. Distribution of negative registrations throughout the year. The occurrence of negative electricity is, as already mentioned, the exceptional case. Expressing the number of registrations, positive and negative, in percents of the total number of hourly

registrations in a year (8760), we have for the positive 85.79 %, for the negative 5.95 %; the remainder of 8.26 % is made up by cases in which the electrical tension was found to have been zero. It is evident that under such circumstances, with but 5 years of observations at command, it would have been useless to have subjected these cases of atmospheric electricity to a rigorous discussion, similar to the one we have just concluded, in as much as the number is too small to allow of the diminution of disturbing effects, indispensable for obtaining satisfactory results. Another circumstance causes us to doubt the practicability of a complete discussion: we refer to the fact that by far in the greater number of negative electrical tensions, the amounts were too great to have been measured by our instrument; and the method adopted in order to turn such registrations to account by supposing them to have been equal to 10, does not seem to warrant any higher degree of accuracy. Although we refrained for these reasons in the present case from the application of any calculus, we feel nevertheless confident that the few facts, which we are enabled to adduce, will prove to be valuable for the advancement of our knowledge on atmospheric electricity.

The little table in this paragraph gives a summary of the registrations on negative electrical tension, and also on such cases where no tension could be perceived. The last two columns contain the mean values for the whole period. We notice that the minimum takes place in July and the maximum in January with respect to negative registrations, the extremes in the occurrence of zero registrations appears to be retarded by one month (minimum in August, maximum in February).

MONTHS.	NUMBER OF REGISTRATIONS.											
	nega-	0	nega-	0	nega-	0	nega-	0	nega-	0	nega-	0
	tive.		tive.		tive.		tive.		tive.		tive.	
	1858-59.		1859-60.		1860-61.		1861-62.		1862.		Mean for 1858-62.	
March	.	.	57	61	49	72	38	183	19	40	40.7	89.0
April	.	.	54	28	26	71	11	73	17	43	27.0	53.7
May	20	75	21	33	42	51	17	66	31	34	26.2	51.8
June	15	46	23	27	16	46	23	24	16	63	18.6	41.2
July	14	99	21	23	14	11	11	54	16	56	15.2	48.6
August	25	60	44	22	10	29	23	28	39	41	28.2	36.0
September	40	47	57	27	66	63	39	26	.	.	50.5	40.7
October	65	68	46	43	43	84	61	15	.	.	53.7	52.5
November	48	107	52	84	68	73	51	18	.	.	54.7	70.5
December	69	70	74	66	77	110	42	48	.	.	65.5	73.5
January	53	81	96	98	98	54	35	18	.	.	70.5	62.7
February	76	77	124	113	37	172	43	54	.	.	70.0	104.0

Comparing the results for the several years we notice a considerable degree of irregularity in the monthly values, so much so, that we cannot fail being surprised at the great distinctness of the law of distribution, as expressed in the means for the whole period.

37. A classification of the negative registrations according to the state of the zenith at the time of each occurrence is certainly of the greatest importance. The plan followed in carrying this into effect is simply this: whenever rain descended, dust floated in the air, the sky over head was completely clear, whenever cumulo-stratus or nimbi covered

the zenith of the observatory, the numbers of registrations of negative tension were for each of these four emergencies, severally, expressed in percents. of the total number of the negative registrations during the respective month and for the year. The following are the results:

MONTHS. (1858—62.)	STATE OF ZENITH AND WEATHER.				Total number of registr.
	Rain.	Dust.	Clear.	Cum. Str. and Nimb.	
March	12.1	20.5	21.6	10.5	199
April	25.6	32.2	8.2	18.1	121
May	48.5	31.6	0.7	14.7	136
June	55.1	21.7	1.4	10.1	69
July	69.2	3.3	3.3	16.5	91
August	51.1	16.5	3.1	15.0	127
September	46.4	27.7	6.8	14.5	220
October	45.3	47.7	7.2	12.4	194
November	27.1	30.8	5.5	19.0	273
December	25.1	36.2	13.3	14.0	279
January	14.9	28.5	15.6	13.6	295
February	3.4	17.9	17.9	21.7	262
YEAR	29.7	27.8	10.4	15.3	2266

Such other cases of negative registration, as do not appertain to any of the above enumerated classes, form on an average 16.8% of the total number. Registrations included in this class mostly occurred when the zenith was covered with cirro-cumuli and cirro-stratus or with a thin veil of clouds.

38. Distribution of registrations of negative electricity over the single hours of the day, and mean hourly tension. Our tables contain the results of an attempt to derive hourly means for the negative electrical tension of the atmosphere. It is scarcely requisite to point out that, for reasons already assigned, we cannot expect, in executing this task, anything like the results established for positive atmospheric electricity. Beside these hourly means stand the numbers of observations from which they were derived; and indeed, these figures offer a better opportunity for judging on the hourly peculiarities in this element, than the mean values. Whereas the latter do not appear to exhibit any regular fluctuation, the figures, expressing the frequency of registration, show clearly an increase until 1^h p.m., from which time they again decrease to a minimum at 2^h a.m. The figures give, in this as in the former case, the total number of registrations in each month and the year for the whole period of observation.

HOURLY MEANS AND FREQUENCY OF NEGATIVE ELECTRICAL TENSION. 1858—62.

MONTHS.	Midn.		1 a.m.		2 a.m.		3 a.m.		4 a.m.		5 a.m.		6 a.m.		7 a.m.		8 a.m.		9 a.m.		10 a.m.		11 a.m.	
	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.
January . .	3	7.50	4	4.09	1	0.50	4	6.89	3	3.25	8	6.01	7	3.61	7	6.91	14	5.98	15	6.49	17	6.31	23	4.23
February . .	2	0.50	2	0.50	1	0.50	2	1.59	1	1.61	1	2.42	2	4.19	1	5.49	8	5.87	14	6.31	18	4.47	24	5.39
March . . .	3	11.00	2	7.11	0	—	1	8.27	0	—	2	2.89	1	2.87	2	3.74	7	7.41	16	8.06	14	7.25	16	5.59
April . . .	3	1.91	4	5.59	1	2.52	2	5.75	3	3.66	1	10.35	0	—	3	5.91	4	7.93	10	7.72	14	7.70	13	6.54
May	3	8.46	5	6.83	0	—	2	6.45	2	1.36	3	2.27	4	6.43	5	4.85	5	5.86	6	7.10	10	3.84	12	8.14
June	2	3.26	2	4.92	1	7.01	1	11.00	4	1.81	1	0.43	0	—	1	7.22	2	3.41	1	3.01	3	5.85	5	6.39
July	4	2.44	4	5.12	6	5.01	1	3.93	2	1.74	6	3.87	3	5.79	2	2.83	4	5.30	2	3.94	3	8.16	4	8.39
August . . .	4	4.72	3	8.86	2	9.96	4	3.30	4	4.45	1	11.00	1	11.00	3	7.23	6	10.45	5	7.98	9	4.72	6	7.28
September .	9	6.46	3	6.19	4	3.29	4	5.27	6	5.83	5	4.13	0	—	2	9.22	7	6.66	15	7.17	11	5.49	16	5.60
October . . .	1	5.68	5	7.59	2	8.75	11	6.01	8	6.52	3	8.05	6	7.06	11	7.27	10	8.29	18	7.74	22	8.11	17	7.57
November . .	4	9.48	2	5.78	3	7.50	8	6.25	3	7.50	3	3.24	3	10.30	7	8.38	7	9.03	20	7.75	19	8.83	23	8.19
December . .	6	8.60	5	5.14	2	6.25	1	0.50	2	7.29	1	2.16	2	6.17	8	7.56	15	7.09	19	6.12	26	4.48	23	6.08
Year	44	5.83	41	5.64	23	5.13	41	5.43	38	4.09	35	4.73	29	6.38	52	6.38	89	6.94	141	6.61	166	6.27	182	6.61

HOURLY MEANS AND FREQUENCY OF NEGATIVE ELECTRICAL TENSION. 1858-62.

MONTHS.	Noon.		1 p.m.		2 p.m.		3 p.m.		4 p.m.		5 p.m.		6 p.m.		7 p.m.		8 p.m.		9 p.m.		10 p.m.		11 p.m.	
	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.	Number.	Means.
January . .	20	5.45	26	5.41	26	6.43	26	4.91	25	4.99	18	5.93	15	5.91	11	6.38	6	4.99	4	3.12	8	5.46	2	3.01
February . .	19	5.69	25	5.44	23	5.52	31	5.38	23	5.76	21	5.75	20	4.33	11	4.14	6	5.65	3	0.79	1	0.50	3	0.33
March . . .	14	2.82	16	5.66	16	4.84	13	5.42	18	2.86	13	2.83	4	2.32	1	11.00	3	0.84	2	0.50	2	0.50	3	4.00
April . . .	12	4.91	14	3.71	7	6.20	4	7.68	7	5.85	5	2.23	2	9.71	4	3.00	2	11.00	2	5.80	2	8.12	1	11.00
May	12	6.61	8	6.34	8	5.58	9	6.76	6	7.21	6	7.00	7	8.77	6	5.21	3	7.67	5	9.82	2	11.00	3	8.18
June	8	4.40	8	4.89	3	6.70	5	6.88	2	6.82	1	11.25	3	5.95	2	7.07	3	8.18	6	5.70	2	6.66	3	11.00
July	6	4.29	2	4.47	8	7.31	9	5.64	7	5.71	3	4.16	1	1.49	2	5.36	3	8.74	5	7.85	2	5.54	2	5.75
August . . .	10	6.00	9	8.36	13	5.61	15	5.62	10	7.51	6	8.58	3	4.84	3	4.45	1	10.00	3	11.00	4	5.53	1	2.38
September .	12	5.81	14	6.05	17	4.65	15	6.80	12	6.92	8	8.62	6	7.83	1	3.35	4	6.28	4	5.93	7	8.30	4	9.02
October . .	22	7.97	16	5.80	20	7.80	18	7.07	6	6.31	7	7.19	8	7.60	3	10.05	3	7.50	5	7.62	3	8.64	1	11.00
November .	26	6.10	24	5.77	17	6.04	17	6.20	21	4.44	9	7.06	12	5.14	6	4.63	3	7.50	2	8.34	4	10.29	5	10.11
December .	22	5.87	23	6.43	20	6.66	16	6.40	24	4.60	18	5.37	13	7.85	5	5.11	3	5.34	2	9.72	4	7.13	4	7.46
Year . . .	183	5.49	185	5.69	178	6.11	178	6.23	161	5.75	115	6.33	94	5.98	55	5.81	40	6.97	43	6.35	41	6.47	32	6.94

39. Distribution of registrations of negative electrical tension according to the wind's direction at the time of observation. In the following deductions the quantity of tension was in no way taken into consideration. The reduction of the values, originally received for 32 points, to only 16 points was effected in strict conformity with the plan followed in similar cases, and explained in the introduction to this volume. The monthly values are expressed in percents. of the total sum of registrations for the respective months. For the yearly results the total sum for the year was adopted as a base.

MONTHS. (1858-62.)	S.	Be- tween S and S.E.	S.E.	Be- tween S.E. and E.	E.	Be- tween E. and N.	N.E.	Be- tween N.E. and N.	N.	Be- tween N. and N.W.	N.W.	Be- tween N.W. and W.	W.	Be- tween W. and S.W.	S.W.	Be- tween S.W. and S.
January	8.6	9.0	3.8	4.8	3.1	2.7	4.1	9.6	15.2	7.9	2.1	4.8	3.8	4.8	3.4	12.1
February	15.7	7.3	10.7	8.0	1.5	2.3	4.2	12.3	10.3	8.0	2.3	0.0	2.3	3.4	1.9	9.6
March	11.2	4.1	3.5	1.8	1.2	2.3	3.5	10.6	18.8	12.9	4.1	2.9	1.8	7.0	4.1	10.0
April	5.0	3.3	0.8	1.7	0.8	0.8	4.2	20.0	27.5	7.5	3.3	5.8	5.8	6.7	3.3	3.3
May	0.7	0.7	0.0	0.0	0.7	3.8	7.6	32.6	25.7	7.6	4.5	5.3	5.3	2.3	1.5	1.5
June	3.0	1.5	0.0	1.5	0.0	0.0	1.5	19.7	30.3	9.1	6.1	3.0	6.1	9.1	6.1	3.0
July	0.0	2.2	0.0	0.0	2.2	4.3	3.3	9.8	29.3	14.1	5.4	1.1	9.8	11.9	3.3	3.3
August	2.4	0.0	0.0	0.0	1.6	1.6	9.7	20.9	20.9	3.2	4.8	3.2	14.5	8.9	4.0	4.0
September	3.6	2.7	0.9	0.0	0.4	1.4	5.4	19.1	22.7	4.5	5.4	2.7	10.0	9.1	7.3	4.5
October	5.4	0.8	1.2	0.0	1.2	2.9	5.8	23.2	20.7	10.8	4.1	3.7	4.6	5.8	3.3	6.2
November	5.5	1.8	3.7	4.0	1.5	2.2	4.8	15.7	20.9	9.1	4.4	2.2	7.7	5.9	5.9	4.8
December	12.3	5.8	1.1	2.2	1.8	2.2	3.2	11.9	23.8	11.2	1.8	0.7	5.4	4.7	2.9	9.0
Year	7.4	3.9	2.8	2.5	1.5	2.3	4.8	16.2	20.5	8.8	3.7	2.8	5.9	6.0	3.9	6.9

The effect of northerly winds, generally carrying clouds of dust through the air, makes itself distinctly manifest in the above series, particularly so in the months from April to October. But we know during this part of the year the mean direction of the wind to be S. $189^{\circ}4'$ E. (N. by W.), and again recognize the division of the year into two large periods, fully delineated, when treating on the mean direction of the wind (pag. 15). During the other part of the year, it is particularly interesting to notice, that negative electrical tension frequently occurs with southerly breezes.

40. Distribution of electrical discharges throughout the year. The number of single thunderstorms and days during which lightning was seen, may be learnt by an inspection of the annexed little table.

1858—63.	MEAN NUMBER OF			1858—63.	MEAN NUMBER OF		
	Thunderst.	cases of Lightg.	cases of Elect. disch.		Thunderst.	cases of Lightg.	cases of Elect. disch.
March . . .	1.4	3.0	4.4	June . . .	1.2	2.2	3.4
April . . .	1.0	4.0	5.0	July . . .	0.0	2.4	2.4
May . . .	1.2	3.4	4.6	August . .	1.2	2.8	4.0
Autumn . .	3.6	10.4	14.0	Winter . .	2.4	7.4	9.8
September .	2.8	5.0	7.8	December .	4.6	5.2	9.8
October . .	5.0	4.8	9.8	January . .	4.2	3.6	7.8
November .	3.8	4.6	8.4	February .	2.2	2.8	5.0
Spring . . .	11.6	14.4	26.0	Summer . .	11.0	11.6	22.6
Year . . .	28.6	43.8	72.4				

It is scarcely necessary to explain that the fractions are caused by taking the average derived from five years. As the above figures represent the mean number of electrical discharges for one year, we obtain by multiplying them by ten the mean number for ten years; for instance: of the mean number of thunderstorms occurring in a period of ten years (286) there are on an average 14 to be expected in the month of March, and so on. In examining the figures expressing the number of cases of lightning we must remember, that the greater duration of daylight in summer must to a certain extent influence the above results to the disadvantage of that season. Making due allowance for this the number of cases of lightning will be so increased, as to cause the result for summer to be equal to that for spring. It is nevertheless evident that in spring the electrical discharges are the most frequent. The lightning observed during the early part of this season is mostly of a globular form (R. I, pag. 164) and sets in about the latter part of August. (the 26th to 31st).

Another fact is worthy of being noticed viz: that the months of April and October, in the course of which the change of the mean direction of wind takes place (chap. I, pag. 15), are marked by a greater number of electrical phenomena, than any of the other months appertaining to the same season. This we find still further manifested on examining the penthemeral results (app. 3.); the periods included between the two months mentioned are clearly to be discerned with regard to frequency of electrical discharges.

41. Distribution of thunderstorms over the hours of the day. The table in this paragraph contains the number of thunderstorms, occurring during 5 years, arranged in groups from three to three hours. We refrained in the present instance from giving the values for one year, as we wished to avoid fractions:

1858—63.	NUMBER OF THUNDERSTORMS FROM							
	mid. to 3.	3 to 6.	6 to 9.	9 to noon.	noon to 3.	3 to 6.	6 to 9.	9 to mid.
March . . .	2	1	0	0	0	0	1	1
April . . .	0	0	0	0	0	3	1	1
May	0	0	0	0	0	4	1	0
June . . .	0	1	0	1	0	0	3	3
July	0	0	0	0	0	0	0	0
August . . .	1	0	0	0	1	0	2	1
September . .	0	1	1	1	4	7	5	0
October . . .	5	4	0	2	4	2	8	5
November . .	4	4	0	0	7	5	6	3
December . .	6	3	1	1	2	11	6	7
January . . .	2	7	1	0	4	10	9	10
February . .	1	1	1	2	1	4	5	5
Year . . .	21	22	4	7	23	46	47	36

It would perhaps not be out of place to add here a few facts bearing on the subject of ozonic reaction, but in as much as the reliability of the instruments, used for this purpose, has been of late very much doubted, it was considered preferable to exclude the results arrived at from the present volume. Suffice it to refer those more particularly interested in this topic to the following passages: R. I, page 77, Daily abstracts R. I, R. II and append. 1 and 2, Penthemeral out lines append. 3 of this volume.

VII. AMOUNT OF CLOUD.

42. Annual march of amount of cloud. The estimation of the amount of cloud, a task generally considered to be easily executed, offers difficulties of a peculiar nature, in case an observer strives for anything like exactness. There cannot be a doubt, it requires considerable practice in order to be able to estimate the extent to which the sky is covered with clouds, but with the means, at present at our command, it is next to impossible to form an exact opinion as to the depth of the stratum. The form of clouds, according to Howard's nomenclature, offers to a certain extent a criterion for the density of the stratum, and we believe that, in expressing the amount in figures, due regard ought to be given to each special class of clouds. Being, however, not aware that a similar plan hitherto has been followed, we prefer giving the amounts in question in the usual way, simply dividing the whole sky in ten equal

parts, and estimating the number of tenths which could be considered as being covered. Whenever but a few little clouds or but a very small patch of clear sky was observable, the figures 0·5 or 9·5 resp. appear in the register. The amount of cloud was invariably in this manner estimated at the moment of registration.

Whenever a thin film of clouds (cirro-stratus) or „veil“ covered the whole sky, the amount was guessed by the degree of depth of the blue. This sort of sky is very frequent, the veil being often so delicate as to be barely visible, and would most likely escape our notice if it was not for the halos round the sun or the moon, by which it makes itself manifest. We shall have to refer to this again.

Prior to entering into a close examination of the mean daily amount, as derived from five years observation, we may consider the penthemeral means of this meteorological element for the same period.

Mean „Five day Means“ in Amount of cloud for the years 1858 to 1863.

NUMBER OF THE PERIOD IN THE resp. MONTHS.	Jan. (1—5)	Febr. (31—4)	March. (2—6)	April. (1—5)	May (1—5)	June (31—4)	July (5—9)	Aug. (4—8)	Sept. (3—7)	Oct. (3—7)	Nov. (2—6)	Dec. (2—6)
	(0—10)	(0—10)	(0—10)	(0—10)	(0—10)	(0—10)	(0—10)	(0—10)	(0—10)	(0—10)	(0—14)	(0—14)
1	5·01	4·62	5·54	5·90	6·98	6·92	6·52	6·30	5·72	4·22	5·54	5·74
2	4·97	6·92	6·24	6·76	6·58	6·60	6·88	6·60	6·20	5·94	5·94	6·32
3	6·56	5·04	5·42	6·92	7·12	6·82	6·16	7·36	6·60	6·44	5·38	5·52
4	5·95	6·32	5·22	5·96	6·24	5·88	6·44	6·48	5·90	6·12	5·72	5·60
5	5·73	5·90	5·96	5·54	6·62	6·68	6·62	5·28	5·04	6·26	6·20	5·74
6	5·65	5·28	4·16	5·20	6·96	6·58	5·54	5·22	5·44	6·96	6·38	4·18
						6·18						

We notice that in the 2^d and 3^d period of April, about the time of the shifting of the mean direction of the wind from South to North, the values are very high, when compared with those immediately before and after, but decrease again to the end of that month. The mean amount assumes a high value at the beginning of May, retaining it until the 5th period in August. The latter part of October, the time of the shifting of the wind from North to South, is again remarkable for a high amount of cloud, but from the commencement of November to the end of March it is generally below the average.

The following table contains the daily means above referred to:

ANNUAL MARCH OF AMOUNT OF CLOUD.

(Mean for the year: ⁽⁰⁻¹⁰⁾5.996).

1858—63		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.
		(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)
1 st		6.14	3.84	8.52	7.98	6.51	4.52	4.81	5.15	6.73	4.68	5.04	4.53
2 ^d		5.16	3.76	5.72	6.75	5.30	4.57	5.98	4.70	4.93	4.23	5.28	3.43
3 ^d		4.78	7.08	7.15	6.66	6.33	6.10	6.87	2.64	5.36	5.83	4.66	5.94
4 th		5.96	6.60	7.74	4.75	6.83	7.01	3.81	3.28	4.06	6.18	4.91	5.48
5 th		5.44	8.14	5.77	4.89	7.56	6.14	6.30	4.82	6.40	6.29	5.09	6.64
6 th		6.34	7.46	6.30	6.03	6.35	6.33	5.36	3.06	6.95	6.13	3.84	5.67
7 th		5.06	7.38	6.52	6.93	5.25	5.37	6.33	7.30	5.67	6.06	3.79	6.87
8 th		6.62	5.98	6.53	7.47	6.26	6.77	6.15	7.38	5.79	6.65	4.88	7.83
9 th		6.46	6.36	6.51	7.73	7.19	5.79	6.11	6.11	5.67	6.25	6.28	7.62
10 th		6.60	6.52	6.96	6.99	7.98	5.79	5.89	5.68	5.72	6.14	6.10	5.62
11 th		6.44	7.84	7.33	7.91	6.34	5.77	6.46	6.66	6.80	6.35	6.96	6.23
12 th		5.88	7.56	7.55	7.04	7.27	7.80	6.33	3.93	5.37	6.43	6.23	6.26
13 th		5.34	6.68	7.73	5.90	6.03	7.89	7.38	4.82	5.74	5.32	6.22	3.29
14 th		5.78	5.40	8.00	6.32	6.73	7.51	6.29	6.44	6.38	5.04	6.97	3.79
15 th		5.18	7.10	4.97	3.55	7.04	6.97	6.57	7.99	4.89	5.28	6.46	6.48
16 th		4.88	7.78	7.40	4.91	6.59	7.34	6.89	7.44	4.69	5.56	6.19	7.57
17 th		6.66	5.74	4.43	5.88	6.00	7.77	5.85	5.58	5.38	4.13	5.48	5.24
18 th		4.60	5.44	4.81	7.32	5.89	7.19	6.41	5.30	7.07	4.74	5.94	6.53
19 th		4.90	5.10	7.85	7.60	5.31	6.36	5.54	6.56	5.65	4.77	5.92	5.72
20 th		4.56	5.68	7.45	6.49	4.22	5.95	5.26	5.69	5.59	7.37	6.25	5.74
21 st		5.42	6.54	7.30	8.08	5.78	7.16	5.46	7.23	4.97	7.02	3.68	6.16
22 ^d		5.64	6.12	7.50	5.60	7.48	7.49	6.73	5.79	5.33	7.10	5.00	5.92
23 ^d		5.88	7.08	5.95	6.48	7.66	5.49	5.83	6.80	6.60	4.13	7.19	5.88
24 th		5.70	5.68	6.32	6.71	7.08	6.57	4.20	5.62	6.02	5.98	7.01	5.69
25 th		5.60	2.36	5.90	7.38	7.10	4.85	5.06	6.23	6.35	6.15	5.67	5.79
26 th		6.98	4.22	7.27	6.09	7.19	3.88	4.20	5.96	6.70	5.35	4.70	4.95
27 th		4.36	5.42	8.05	7.35	6.94	5.84	5.97	6.37	6.95	5.75	5.24	4.26
28 th		4.28	6.24	5.19	6.35	5.49	5.33	5.34	7.65	7.77	4.45	5.81	4.76
29 th		2.72	4.06	6.85	5.68	6.31	5.21	5.69	6.65	7.77	3.22	7.03	
30 th		5.08	6.06	7.41	5.82	7.75	5.01	6.36	7.52	6.72	2.50	5.46	
31 st		4.32		8.49		4.75	5.00		6.33		5.03	3.73	
MEANS.	observed	5.44	6.04	6.82	6.49	6.46	6.15	5.85	5.89	6.00	5.49	5.58	5.71
	calculated	5.62	6.06	6.61	6.73	6.39	6.05	5.97	5.94	5.80	5.67	5.61	5.53
	calc. — observ.	+0.18	+0.02	-0.21	+0.24	-0.07	-0.10	+0.12	+0.05	-0.20	+0.18	+0.01	-0.18
MEANS FOR THE QUARTERS.		6.103			6.369			5.914			5.589		

The monthly means, derived from the above, were used for determining by the method of the least squares the annual interpolation series as follows:

$$C^{(n)} = 5.996^{(0-10)} + 0.474 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 240^\circ 58' \right\} + 0.238 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 91^\circ 14' \right\} \\ + 0.090 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 265^\circ 29' \right\} + \dots$$

In order to examine the reliability of this formula, the monthly means have been computed by it, and the differences at the foot of the table clearly illustrate, how well this series corresponds with the actual fluctuation of the amount of cloud in the course of the year.

The discussion of the equation with the object of determining the time of the extreme values, give for the Maximum the 9th 2 of June and for the Minimum the 8th 3 of February

43. Diurnal Fluctuation of Amount of cloud. Much has been said already on the method of constructing the tables, calculated to exhibit the hourly change in the various meteorological elements. In the present instance we proceeded in the usual way. The figures contained in the table of this paragraph, served to establish the following formulae:

For <i>March</i>	$C^{(n)} = 5.384^{(0-10)} + 0.6613 \sin (n15^\circ + 162^\circ 42') + 0.1062 \sin (n30^\circ + 295^\circ 34')$
	$+ 0.0749 \sin (n45^\circ + 313^\circ 39') + \dots$
„ <i>April</i> . .	$= 6.034 + 0.7380 \sin (n15^\circ + 118^\circ 49') + 0.0535 \sin (n30^\circ + 249^\circ 2')$
	$+ 0.0488 \sin (n45^\circ + 323^\circ 20') + \dots$
„ <i>May</i> . .	$= 6.758 + 0.4462 \sin (n15^\circ + 83^\circ 28') + 0.1505 \sin (n30^\circ + 258^\circ 30')$
	$+ 0.0902 \sin (n45^\circ + 351^\circ 30') + \dots$
„ <i>June</i> . .	$= 6.474 + 0.5571 \sin (n15^\circ + 111^\circ 30') + 0.0734 \sin (n30^\circ + 291^\circ 19')$
	$+ 0.1269 \sin (n45^\circ + 311^\circ 32') + \dots$
„ <i>July</i> . .	$= 6.293 + 0.3722 \sin (n15^\circ + 85^\circ 7') + 0.1440 \sin (n30^\circ + 290^\circ 19')$
	$+ 0.0484 \sin (n45^\circ + 100^\circ 55') + \dots$
„ <i>August</i> .	$= 6.267 + 0.3217 \sin (n15^\circ + 169^\circ 6') + 0.0798 \sin (n30^\circ + 40^\circ 21')$
	$+ 0.1288 \sin (n45^\circ + 238^\circ 42') + \dots$
„ <i>September</i>	$= 5.816 + 0.3968 \sin (n15^\circ + 80^\circ 49') + 0.0304 \sin (n30^\circ + 80^\circ 32')$
	$+ 0.1560 \sin (n45^\circ + 216^\circ 45') + \dots$
„ <i>October</i> .	$= 5.923 + 0.5531 \sin (n15^\circ + 161^\circ 6') + 0.3275 \sin (n30^\circ + 245^\circ 39')$
	$+ 0.0479 \sin (n45^\circ + 125^\circ 4') + \dots$
„ <i>November</i>	$= 6.024 + 0.5208 \sin (n15^\circ + 158^\circ 42') + 0.3366 \sin (n30^\circ + 216^\circ 27')$
	$+ 0.1670 \sin (n45^\circ + 238^\circ 3') + \dots$
„ <i>December</i>	$= 5.272 + 0.2525 \sin (n15^\circ + 128^\circ 50') + 0.0819 \sin (n30^\circ + 225^\circ 25')$
	$+ 0.1259 \sin (n45^\circ + 271^\circ 31') + \dots$
„ <i>January</i>	$= 5.777 + 0.4200 \sin (n15^\circ + 132^\circ 16') + 0.1534 \sin (n30^\circ + 213^\circ 16')$
	$+ 0.1346 \sin (n45^\circ + 328^\circ 40') + \dots$
„ <i>February</i>	$= 5.764 + 0.6724 \sin (n15^\circ + 147^\circ 58') + 0.2148 \sin (n30^\circ + 238^\circ 10')$
	$+ 0.0589 \sin (n45^\circ + 146^\circ 32') + \dots$
„ <i>the Year</i>	$= 5.982 + 0.4389 \sin (n15^\circ + 132^\circ 23') + 0.1204 \sin (n30^\circ + 243^\circ 15')$
	$+ 0.0587 \sin (n45^\circ + 276^\circ 31') + \dots$

Diurnal Fluctuation of Amount of Cloud.

Hour.	During the years 1858 to 1863.												
	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	year.
Midnight	(0-10) 5.10	(0-10) 5.25	(0-10) 6.14	(0-10) 5.85	(0-10) 5.64	(0-10) 6.50	(0-10) 5.43	(0-10) 5.48	(0-10) 5.87	(0-10) 5.42	(0-10) 5.46	(0-10) 5.43	(0-10) 5.631
1 ^h A M	5.40	5.54	6.18	6.08	5.99	6.46	5.70	5.67	5.98	5.39	5.41	5.49	5.774
2	5.45	5.73	6.04	6.02	5.91	6.41	5.67	5.70	6.00	5.26	5.41	5.62	5.768
3	5.69	5.67	6.25	6.16	6.21	6.30	5.42	6.17	5.77	5.12	5.41	5.60	5.807
4	5.65	5.88	6.67	6.27	6.31	6.60	5.34	6.35	6.12	5.55	5.73	6.07	6.045
5	6.09	6.27	6.68	6.87	6.36	6.48	5.56	6.46	6.18	5.55	6.09	6.43	6.252
6	6.36	6.47	6.93	6.50	6.30	6.65	5.61	6.62	6.44	5.61	6.51	6.45	6.371
7	6.14	6.77	7.18	7.22	6.56	6.41	5.99	6.84	7.15	5.88	6.39	6.72	6.688
8	6.06	6.69	6.97	6.88	6.57	6.33	5.87	7.00	7.13	5.92	6.45	6.46	6.528
9	5.89	6.81	7.00	6.97	6.40	6.74	6.14	6.43	6.97	5.89	6.14	6.58	6.497
10	5.72	6.62	6.89	6.90	6.42	6.52	6.22	6.10	6.49	5.67	6.28	6.33	6.347
11	5.50	6.67	6.95	6.88	6.54	6.47	6.33	6.09	6.15	5.69	6.02	6.25	6.295
Noon	5.51	6.54	7.29	6.87	6.68	6.29	6.23	5.92	5.87	5.51	5.91	5.90	6.210
1 ^h P M	5.38	6.61	7.01	6.87	6.80	6.14	6.01	5.69	5.75	5.41	5.93	5.85	6.121
2	5.39	6.54	7.22	6.67	6.64	6.15	6.06	5.61	5.53	5.54	5.72	5.63	6.058
3	5.05	6.25	7.01	6.90	6.45	6.23	6.12	5.50	5.63	5.50	5.70	5.41	5.979
4	4.97	5.88	7.00	6.87	6.40	6.18	6.14	5.40	5.73	5.49	5.54	5.28	5.907
5	4.95	5.81	7.08	6.63	6.76	5.92	6.04	5.57	5.65	5.55	5.49	5.35	5.900
6	4.92	5.94	7.03	5.98	6.72	6.13	6.15	5.85	5.60	5.34	5.37	5.45	5.873
7	4.81	5.55	6.75	6.03	6.27	5.84	5.72	5.80	5.89	5.31	5.44	5.56	5.748
8	4.59	5.28	6.56	6.07	6.06	5.68	5.51	5.71	6.10	5.36	5.34	5.43	5.641
9	4.67	5.35	6.44	5.86	6.13	5.85	5.41	5.54	5.62	5.00	5.26	5.07	5.517
10	4.83	5.42	6.49	6.10	6.04	5.98	5.38	5.42	5.48	5.16	5.50	4.98	5.565
11	5.09	5.27	6.44	5.93	5.74	6.14	5.54	5.24	5.48	5.41	5.55	4.99	5.568

In glancing over the figures of this table we are struck by the regularity in the diurnal change of amount of cloud, a fact which is not readily anticipated on account of the very nature of the element in question. The law of its hourly motion is still more distinctly defined by the equations at the beginning of this paragraph. How well they correspond with actual observation may be illustrated by the subsequent table:

Table shewing the Difference between the observed and calculated values of the Diurnal fluctuation of Amount of Cloud
(calculated minus observed values).

HOOR.	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Feb.	Year.
Midnight	(0-10) +0.03	(0-10) +0.11	(0-10) +0.04	(0-10) +0.12	(0-10) +0.09	(0-10) -0.13	(0-10) +0.12	(0-10) -0.08	(0-10) -0.09	(0-10) -0.07	(0-10) 0.00	(0-10) -0.24	(0-10) -0.023
1h AM	-0.11	-0.10	-0.05	-0.10	-0.19	+0.04	-0.09	-0.13	-0.17	-0.05	-0.03	-0.13	-0.112
2	+0.02	-0.16	+0.12	+0.01	+0.03	+0.12	-0.08	+0.09	-0.14	+0.05	-0.03	-0.02	-0.027
3	-0.02	+0.08	+0.06	-0.01	-0.03	+0.18	+0.11	-0.10	+0.15	+0.18	+0.09	+0.26	+0.055
4	+0.22	+0.11	-0.14	+0.09	-0.08	-0.17	+0.13	0.00	-0.04	-0.18	0.00	+0.03	-0.020
5	-0.04	-0.02	+0.08	-0.28	-0.03	-0.07	-0.07	+0.08	+0.14	-0.04	-0.08	-0.12	-0.039
6	-0.20	+0.01	+0.02	+0.32	+0.09	-0.18	0.00	+0.09	+0.17	+0.09	-0.25	+0.01	+0.022
7	+0.03	-0.13	-0.14	-0.24	-0.15	+0.13	-0.18	-0.09	-0.34	-0.03	+0.01	-0.17	-0.170
8	+0.03	+0.04	+0.08	+0.13	-0.15	+0.27	+0.16	-0.31	-0.13	+0.01	-0.05	+0.13	+0.031
9	+0.03	-0.06	+0.02	-0.01	+0.05	-0.13	+0.05	+0.12	-0.04	-0.01	+0.16	-0.04	+0.014
10	+0.01	+0.10	+0.09	-0.02	+0.08	0.00	+0.04	+0.24	+0.16	+0.08	-0.14	+0.08	+0.0.0
11	+0.05	0.00	+0.05	-0.06	0.00	-0.07	-0.11	0.00	+0.18	-0.09	-0.01	-0.04	-0.035
Noon	-0.08	+0.06	-0.25	-0.04	-0.11	-0.02	-0.08	-0.06	-0.01	-0.02	+0.03	+0.07	-0.070
1h PM	-0.03	-0.09	+0.10	-0.01	-0.20	+0.06	+0.08	-0.05	-0.14	+0.05	-0.03	-0.11	-0.059
2	-0.12	-0.13	-0.06	+0.22	-0.04	+0.02	+0.03	-0.10	-0.01	-0.05	+0.16	-0.09	-0.037
3	+0.14	+0.02	+0.14	-0.05	+0.13	-0.05	+0.01	-0.01	-0.05	+0.04	+0.10	+0.03	+0.015
4	+0.10	+0.21	+0.09	-0.17	+0.17	-0.01	+0.01	+0.15	-0.03	+0.06	+0.15	+0.12	+0.046
5	-0.02	+0.06	-0.10	-0.14	-0.23	+0.17	+0.07	+0.07	+0.15	-0.06	+0.08	+0.06	-0.117
6	-0.12	-0.26	-0.16	+0.28	-0.25	-0.16	-0.18	-0.12	+0.23	+0.04	+0.09	-0.03	-0.086
7	-0.10	-0.03	+0.01	+0.03	+0.08	0.00	+0.05	-0.05	-0.12	-0.04	0.00	-0.17	-0.062
8	+0.10	+0.13	+0.11	-0.12	+0.14	+0.10	+0.06	-0.02	-0.40	-0.17	+0.12	-0.12	-0.034
9	+0.07	0.00	+0.12	+0.06	-0.10	-0.04	+0.02	+0.03	+0.03	+0.18	+0.26	+0.13	+0.044
10	+0.02	-0.10	-0.05	-0.16	-0.18	-0.02	+0.02	+0.02	+0.17	+0.09	+0.06	+0.15	-0.012
11	-0.10	+0.06	-0.14	+0.05	+0.02	+0.04	-0.08	+0.13	+0.23	-0.09	-0.04	+0.12	+0.004

A discussion of the differential equation, derived from the above series, results the tropical hours and their corresponding values for amount of cloud, as given in the subjoined table:

Time and value of the extremes in diurnal fluctuation of amount of cloud.

MONTHS.	MAXIMUM.		MINIMUM.		MONTHS.	MAXIMUM.		MINIMUM.	
	time.	value.	time.	value.		time.	value.	time.	value.
	A. M.		P. M.			A. M.		P. M.	
	h. m.	(0-10)	h. m.	(0-10)		h. m.	(0-10)	h. m.	(0-10)
March . . .	6 39	6.18	7 34	4.69	September .	10 4	6.26	9 45	5.40
April . . .	8 48	6.78	10 19	5.32	October . .	6 52	6.75	11 14	5.37
May . . .	2 23*	7.16	1 9*	6.12	November .	8 8	7.01	2 2	5.52
June . . .	7 52	7.01	8 53	5.92	December .	8 5	5.92	8 27	5.19
July . . .	1 38*	6.59	11 44	5.73	January . .	7 30	6.42	1 31*	5.37
August . .	8 27	6.61	8 9	5.78	February . .	7 54	6.59	10 41	5.10
Year . . .	7 57	6.560	9 44	5.553	* Whenever an asterisk is attached to the time it signifies that, with regard to the time occurring A. M. or P. M., the resp. case forms an exception to what is indicated by the head of the column.				

For further information on this topic we refer to R. I. pag. 59 and appendix 18.

44. Windrose for amount of cloud. Appendix 18 of this volume shows the table from which the subjoined is derived in the usual manner.

Monthly Means of Amount of Cloud for sixteen points of the Compass.

DIREC- TION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.
	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)
S.	5.31	6.48	6.26	6.09	5.08	5.30	5.71	5.96	5.29	4.93	5.71	5.56
S.S.E.	5.04	6.83	6.96	6.39	5.24	4.85	5.94	5.59	5.71	5.17	5.92	6.16
S.E.	5.64	6.25	6.66	5.55	6.58	4.28	4.88	4.88	5.87	5.28	5.09	6.53
E.S.E.	5.95	6.12	5.84	4.51	5.70	2.10	5.12	5.40	4.53	6.22	4.38	5.95
E.	5.22	4.87	5.44	5.44	5.23	4.01	4.19	6.03	5.84	5.98	5.32	5.02
E.N.E.	5.02	4.17	6.08	4.29	4.94	5.00	4.44	4.59	5.70	4.68	4.72	4.03
N.E.	3.83	4.17	5.08	5.38	5.26	4.37	4.47	4.93	5.20	5.04	4.36	4.75
N.N.E.	4.64	4.97	5.79	5.97	6.14	5.65	5.72	5.46	5.48	4.92	4.62	4.59
N.	5.24	5.36	6.57	7.03	6.29	6.18	5.71	5.56	5.66	5.13	4.78	4.37
N.N.W.	5.01	6.00	7.09	7.14	6.91	5.89	5.28	5.63	5.10	6.02	5.06	4.39
N.W.	5.11	5.76	7.27	6.01	6.24	6.57	6.47	5.88	6.11	5.61	5.23	4.65
W.N.W.	5.72	6.98	7.69	6.06	6.67	6.59	6.83	6.28	6.22	5.63	6.17	5.03
W.	6.52	7.47	7.79	7.86	7.58	7.47	7.25	6.95	7.08	6.45	6.50	6.99
W.S.W.	7.44	8.14	8.34	8.47	7.98	8.19	7.38	7.97	7.09	7.30	7.59	6.98
S.W.	6.60	7.54	7.92	7.49	7.01	7.51	7.35	7.04	6.97	5.81	6.48	6.90
S.S.W.	5.61	6.20	6.78	6.22	5.85	6.22	6.00	5.42	5.82	5.13	5.72	5.70
u =	5.4937	6.0819	6.7225	6.2437	6.1687	5.6675	5.7962	5.8481	5.8543	5.5812	5.4781	5.4750

To examine the influence of the mean direction of the wind on the amount of cloud, we have $u-m$ for the various months as follows:

March: + 0.05 (S.S.W.); April: + 0.04 (N.W. by W.); May: — 0.10 (N. N. W.); June: — 0.25 (N. by E.); July: — 0.29 (N. $\frac{1}{2}$ W.); August: — 0.48 (N.N.W.); September: — 0.05 (N.N.W.); October: — 0.04 (W. by N.); November: — 0.15 (S.W. by S.); December: + 0.09 (S.S.W.); January: — 0.10 (S.S.W.); February: — 0.24 (S. by W.);

The wind directions within the brackets are the monthly mean directions, given only to the nearest point.

A further reduction of the monthly to quarterly values has been executed according to the method proposed by M. Kämtz, and is explained in the introduction to this volume. The second columns in each season and the year contain the values thus obtained.

DIREC- TION OF WIND.	Derived from observations during the years 1858 to 63.														
	AUTUMN.			WINTER.			SPRING.			SUMMER.			YEAR.		
	calculated.	observed.	calculated minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.	calculated.	observed.	calculated. minus observed.
	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)
S.	5.753	5.626	+0.127	5.609	5.384	+0.225	6.359	6.111	+0.248	6.045	5.502	+0.543	6.026	5.749	+0.297
S.S.E.	5.352	5.694	— .342	5.446	5.487	— .041	6.208	6.200	+ .008	5.727	5.625	+ .102	5.745	5.852	— .107
S.E.	5.153	5.308	— .155	5.432	5.686	— .254	6.122	6.253	— .131	5.373	5.575	— .202	5.597	5.833	— .256
E.S.E.	5.119	4.876	+ .243	5.445	5.565	— .120	5.965	6.283	— .318	5.004	4.159	+ .845	5.464	5.574	— .110
E.	5.150	5.462	— .312	5.350	5.548	— .198	5.659	5.618	+ .041	4.715	4.969	— .254	5.341	5.509	— .168
E.N.E.	5.164	4.866	+ .298	5.104	4.544	+ .560	5.249	5.174	+ .075	4.637	4.662	— .025	5.199	4.817	+ .382
N.E.	5.151	4.809	+ .342	4.790	4.713	+ .072	4.904	4.352	+ .552	4.861	5.173	— .312	5.095	4.717	+ .378
N.N.E.	5.180	5.598	— .418	4.581	4.732	— .151	4.823	5.104	— .281	5.388	5.925	— .537	5.129	5.382	— .253
N.	5.351	5.666	— .315	4.639	4.855	— .216	5.123	5.369	— .246	6.097	6.509	— .412	5.376	5.818	— .442
N.N.W.	5.718	5.398	+ .320	5.014	5.354	— .340	5.758	6.065	— .307	6.795	6.703	+ .092	5.829	5.951	— .122
N.W.	6.231	6.212	+ .019	5.604	5.264	+ .340	6.526	6.192	+ .334	7.295	6.284	+ 1.011	6.381	6.037	+ .344
W.N.W.	6.745	6.514	+ .231	6.193	5.663	+ .530	7.153	6.866	+ .287	7.488	6.483	+ 1.005	6.866	6.431	+ .435
W.	7.078	7.114	— .036	6.562	6.623	— .061	7.467	7.258	+ .209	7.383	7.552	— 0.169	7.129	7.147	— .018
W.S.W.	7.098	7.461	— .363	6.596	7.306	— .710	7.393	7.967	— .574	7.081	8.242	— 1.161	7.099	7.742	— .643
S.W.	6.797	7.056	— .259	6.334	6.378	— .044	7.056	7.369	— .313	6.711	7.468	— 0.757	6.819	7.045	— .226
S.S.W.	6.288	5.664	+ .624	5.941	5.526	+ .415	6.657	6.244	+ .413	6.360	6.135	+ 0.225	6.413	5.892	+ .521
u =		5.833			5.540			6.150			6.060			5.991	

The method of the least squares, applied to the values of the above table, yields the following equations:

$$\begin{aligned}
 \text{for Autumn} \dots C^{(m)} &= 5.833 + 0.984 \sin(m 22^\circ 30' + 168^\circ 13') + 0.314 \sin(m 45^\circ 0' + 243^\circ 21') + \dots \\
 \text{,, Winter} \dots &= 5.540 + 0.776 \sin(m 22^\circ 30' + 141^\circ 20') + 0.417 \sin(m 45^\circ 0' + 266^\circ 58') + \dots \\
 \text{,, Spring} \dots &= 6.152 + 1.095 \sin(m 22^\circ 30' + 145^\circ 39') + 0.445 \sin(m 45^\circ 0' + 292^\circ 43') + \dots \\
 \text{,, Summer} \dots &= 6.060 + 1.334 \sin(m 22^\circ 30' + 181^\circ 7') + 0.274 \sin(m 45^\circ 0' + 218^\circ) + \dots \\
 \text{,, the Year} \dots &= 5.991 + 0.951 \sin(m 22^\circ 30' + 160^\circ 1') + 0.267 \sin(m 45^\circ 0' + 272^\circ 22') + \dots
 \end{aligned}$$

By these formulae was computed the amount of cloud for 16 points of the compass; the first column in each season of the above table shows the results, while the last contains the differences between the observed and calculated values. These differences illustrate the reliability of the proposed formulae, for the mean errors are for the several seasons, commencing with autumn: ± 0.275 , ± 0.267 , ± 0.271 , ± 0.478 and for the year ± 0.294 .

The various values for $u-m$ are as follows: in Autumn: -0.270 (N.W. $\frac{1}{2}$ N.); in Winter: -0.829 (N. by W.); in Spring: $+0.236$ (W.N.W. $\frac{1}{4}$ W.); in Summer: $+0.471$ (S.S.W.); for the year: -0.005 (N.W. $\frac{1}{2}$ W.). These results differ materially from those obtained by monthly means, as above described; it appears that the mean direction of the wind causes the amount of cloud to be too high in autumn and winter, and too low in spring and summer, a law which does not so clearly elicit from the simple monthly means, without having applied a correction for the inequality of the number of observations from the various points.

The points where the amount of cloud reaches a maximum and minimum value within the windrose and those, where the same becomes equal to the mean, have been determined in the usual manner. Here are the results:

PERIOD.	MAXIMUM.		MINIMUM.		MEAN.	
	position.	value.	position.	value.	positions.	
Autumn . .	S. $282^\circ 37'$ E.	⁽⁰⁻¹⁰⁾ 7.131	S. $62^\circ 33'$ E.	⁽⁰⁻¹⁰⁾ 5.116	SE. $207^\circ 58'$ E. and S. $356^\circ 24'$ E.	
Winter . . .	$283^\circ 18'$	6.623	$164^\circ 50'$	4.565	$222^\circ 45'$	„ $6^\circ 45'$
Spring . . .	$276^\circ 18'$	7.483	$151^\circ 34'$	4.809	$214^\circ 1'$	„ $37^\circ 21'$
Summer . .	$249^\circ 58'$	7.490	$107^\circ 58'$	4.630	$178^\circ 52'$	„ $358^\circ 52'$
Year	$278^\circ 52'$	7.152	$142^\circ 28'$	5.087	$208^\circ 12'$	„ $3^\circ 54'$

45. Amount of cloud during calms. The total number of observations, from which these results were derived, is 1484.

1858—63.	Mean Amt. minus Amount in Calms.	AMOUNT.	1858—63.	Mean Amt. minus Amount in Calms.	AMOUNT.
March . . .	⁽⁰⁻¹⁰⁾ -0.24	⁽⁰⁻¹⁰⁾ 5.68	June	⁽⁰⁻¹⁰⁾ $+0.04$	⁽⁰⁻¹⁰⁾ 6.45
April	$+0.57$	5.47	July	$+1.46$	5.00
May	$+0.18$	6.64	August . . .	$+1.66$	4.49
Autumn . .	$+0.127$	5.98	Winter . .	$+1.187$	5.18
September .	$+3.39$	2.46	December .	$+1.80$	3.69
October . .	$+0.85$	5.04	January . .	$+0.35$	5.23
November .	$+0.81$	5.19	February .	$+2.33$	3.38
Spring . . .	$+1.455$	4.46	Summer . .	$+1.624$	3.96
Year	$+0.982$	5.014			

We glean from the above that the amount is less in calm than in breezy weather. This difference is particularly marked during spring and summer, and less so in autumn and winter; in the months from March to June it seems to decrease to almost nothing. Calm weather in September and February seems to be very favorable to a clear sky.

VIII. TEMPERATURE OF SOIL.

46. All thermometers for observing the temperature of soil were erected on a small; patch of land, 4 feet by 11, which was kept about 5 inches above the surrounding ground by a slight timber frame. The mode of observing the temperature of the soil on the surface was fully described in R. I. pag. 2 and R. II. pag. 4, and it is only to be remarked in addition that no grass was allowed to grow near the spot of exposure which would have been likely to interfere with the full action of sun and wind, and would most probably have exerted an undue influence by an increased radiation. It is particularly important to know that the bulb of the thermometer was in this case but just kept covered with sand or soil, which was of a medium depth in color. In order to protect the instrument a net of very large meshes was fixed over it; the readings were taken hourly, and all subsequent results on the temperature of the soil at the surface must be judged accordingly.

The thermometer, intended for the registration of the temperature of the soil fourteen inches below the surface, was mounted in a horizontal position; it passed through the sides of a strong wooden box, only the stem being visible near its bottom, while the bulb entered the ground close to its walls. The box having been made water-tight by the aid of cement, it was but very rarely filled with water. A lid prevented the weather from exerting any immediate influence upon the readings.

The ground-thermometers for depths of 31, 65 and 100 inches below the surface were perpendicularly fixed on a line running east and west at distances from each other of 1.5 feet. Although each thermometer was enclosed within a wooden box, so that only the top-parts of the glass-stems were visible, a wooden shade with double walls protected the ground in the immediate vicinity against the influence of the weather. In spite of all these precautions, we shall see when speaking upon the diurnal variations in temperature of soil, that there is still some undue influence, however trifling, noticeable in the results of the observations. The registrations of the ground-thermometers extend over the period from April 1861 to the end of February 1863; they were effected every third hour, commencing with 2^h a. m., and consequently the results, embodied in the following paragraphs, have been derived from 8 observations taken during a day. It may be further remarked that the soil into which the thermometers were buried was of the usual description near the locality of the observatory, namely a compact ferruginous gravel, covered to a depth of about 2 feet by a light surface soil.

47. Annual March of Temperature of Soil. The subjoined table, exhibiting the annual fluctuations of the temperature of the soil at the surface, was derived from hourly observations, as above mentioned.

ANNUAL MARCH OF TEMPERATURE OF SURFACE SOIL.

(Mean for the year: 61°523.)

1858—63		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF THE MONTH.		March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.
1 st		72°46	69°50	57°02	50°40	46°54	46°92	56°10	59°10	63°08	73°24	78°72	74°82
2 ^d		73°14	69°68	55°28	49°58	47°06	46°68	55°54	59°88	63°62	73°40	78°48	77°46
3 ^d		74°72	67°02	53°88	49°80	46°48	48°76	57°08	60°48	62°28	69°24	78°12	76°14
4 th		75°18	65°86	57°80	49°36	46°24	48°76	56°92	61°34	64°98	73°88	76°16	76°28
5 th		71°56	60°65	57°70	47°84	47°92	51°14	58°26	62°24	64°80	69°72	78°46	75°88
6 th		69°18	61°22	55°70	49°04	47°82	49°96	57°42	65°52	64°76	74°26	79°42	75°54
7 th		71°50	61°27	54°96	49°88	47°62	50°94	54°64	66°72	65°92	70°08	82°44	70°90
8 th		70°22	59°72	56°38	50°04	47°62	49°40	54°76	61°04	68°60	69°26	78°56	72°52
9 th		72°04	58°85	56°18	49°56	47°74	50°20	53°88	60°12	69°66	69°02	78°18	66°48
10 th		72°96	59°85	57°78	49°32	48°82	51°40	55°80	59°84	71°22	70°96	76°10	71°14
11 th		74°02	61°62	55°70	51°04	47°78	48°30	54°56	59°34	64°52	71°08	74°24	71°58
12 th		73°86	57°44	55°82	51°04	46°54	50°00	54°26	60°84	66°40	66°76	71°28	71°28
13 th		74°42	60°32	54°24	50°30	45°66	49°72	54°10	64°04	69°22	69°76	73°52	74°82
14 th		74°62	55°60	55°30	48°76	46°48	47°64	53°50	63°98	67°04	74°28	75°48	78°90
15 th		71°64	60°80	54°24	45°74	45°56	48°28	51°22	61°17	68°40	72°48	75°86	73°16
16 th		72°92	59°02	53°52	45°58	47°50	50°12	52°84	61°82	72°76	72°40	70°64	70°16
17 th		67°60	57°05	52°26	47°88	47°96	50°44	54°12	59°68	75°12	72°64	73°70	72°10
18 th		64°35	57°32	51°14	48°18	48°00	51°32	51°67	63°44	74°58	73°30	72°22	69°02
19 th		68°34	58°30	52°66	49°90	46°78	52°26	55°45	60°38	73°78	73°86	74°32	69°46
20 th		71°56	59°30	52°92	49°82	47°40	52°28	54°70	59°40	75°14	70°55	74°20	72°02
21 st		68°04	59°44	52°06	51°04	47°34	52°38	55°02	64°36	77°18	67°07	79°40	69°56
22 ^d		66°70	58°02	52°44	49°56	47°66	54°30	56°20	62°94	77°38	66°80	77°28	71°40
23 ^d		67°00	56°78	52°44	47°62	46°74	53°84	55°22	63°16	73°18	73°06	72°44	72°26
24 th		68°38	59°54	50°18	47°40	46°54	53°54	56°87	63°20	69°96	70°94	73°02	73°00
25 th		69°32	59°88	49°34	48°18	48°06	52°88	59°40	66°62	68°04	73°68	71°90	71°22
26 th		65°34	59°98	50°66	47°24	48°20	52°84	57°50	67°46	67°72	78°98	70°96	74°88
27 th		68°28	61°04	50°86	47°48	48°52	55°24	57°12	66°34	68°84	72°12	74°66	72°14
28 th		67°44	59°94	51°00	48°32	49°02	55°18	58°26	61°12	65°54	73°62	76°86	73°34
29 th		67°36	62°04	51°06	47°10	46°70	52°16	55°44	62°40	67°70	76°40	74°64	
30 th		66°32	59°58	48°28	46°96	47°62	50°18	57°48	62°94	69°78	79°84	73°12	
31 st		66°28		49°14		47°84	52°48		64°98		81°12	75°38	
MEANS	observed	70°22	60°55	53°48	48°80	47°35	50°95	55°51	62°45	69°04	72°38	75°48	72°77
	calculated	69°12	61°22	53°21	48°46	47°81	50°44	55°67	62°44	68°71	72°84	74°62	73°74
	calc. obs.	— 1°10	+ 0°67	— 0°27	— 0°34	+ 0°46	— 0°51	+ 0°16	— 0°01	— 0°33	+ 0°46	— 0°86	+ 0°96
MEANS FOR THE QUARTERS.		61°427			49°035			62°334			73°567		

The means for the single years of observation are as follows: 1858—59: 60°58, 1859—60: 61°87, 1860—61: 60°93, 1861—62: 61°90: 1862—63: 62°67.

The monthly means were treated by the method of the least squares in order to obtain the following interpolation series:

$$T^{(n)} = 61.523 + 13.776 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 47^\circ 27' \right\} + 0.884 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 249^\circ 39' \right\} + 0.357 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 138^\circ 45' \right\} + \dots$$

According to this formula we computed the monthly means inserted at the foot of the above table, and we may safely adopt the proposed equation as a true representation of the actual march in temperature of surface soil in the course of a year, the mean probable error amounting only to ± 0.511.

A discussion of the above equation with a view to determine the tropical points of the annual curve results for the Maximum the 19.8th day of January and for the Minimum the 7.0th day of July.

Before leaving this subject we subjoin a little table, containing the monthly means of the temperature at the surface of the soil, the water in the evaporation gauge, the Bay and the river Yarra, compared with the monthly means of the temperature of air.

Temperature of	M e a n s f o r												
	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Year.
	°	°	°	°	°	°	°	°	°	°	°	°	°
air	64.85	58.42	53.38	49.21	47.68	50.04	53.37	57.80	61.62	64.51	67.87	65.58	57.832
Surface soil . .	70.22	60.55	53.48	48.80	47.35	50.95	55.51	62.46	69.04	72.38	75.48	72.77	61.523
Surface of Evap.- Gauge . .	66.69	59.27	52.71	48.76	47.58	50.53	54.79	60.30	64.70	68.25	70.18	68.42	59.348
Surface of Bay	61.10	58.20	58.10	53.90	51.10	50.10	52.40	58.20	(61.90)	(65.60)	69.30	67.70	58.967
Surface of R. Yarra . .	(65.73)	62.83	54.62	48.41	47.81	48.22	50.80	59.40	66.72	72.03	74.36	(72.33)	60.272

Note: Those values within brackets were obtained by interpolation.

The observations on the fluctuations of temperature at various depths gave the following results:

MONTHS OF	14 inches			31 inches			65 inches			100 inches		
	calcul. means.	observ. means.	calcul. minus observ.	calcul. means.	observ. means.	calcul. minus observ.	calcul. means.	observ. means.	calcul. minus observ.	calcul. means.	observ. means.	calcul. minus observ.
	o	o	o	o	o	o	o	o	o	o	o	o
March	69.95	69.86	+ 0.09	70.30	70.01	+ 0.29	70.37	70.05	+ 0.32	68.39	68.05	+ 0.34
April	62.16	61.08	+ 1.08	63.87	62.84	+ 1.03	65.70	64.91	+ 0.69	65.61	65.35	+ 0.46
May	54.95	54.89	+ 0.06	56.84	56.41	+ 0.43	59.79	59.47	+ 0.32	61.69	61.50	+ 0.19
June	50.44	50.54	- 0.10	51.25	51.31	- 0.06	54.62	54.64	- 0.02	57.28	57.11	+ 0.17
July	48.32	48.45	- 0.13	47.93	48.45	- 0.52	51.10	51.54	- 0.44	53.51	54.07	- 0.56
August	48.84	49.32	- 0.48	47.99	48.53	- 0.54	50.15	50.54	- 0.39	51.65	51.74	- 0.09
September . .	52.63	53.74	- 1.11	51.86	52.93	- 1.07	52.35	53.24	- 0.89	52.59	53.25	- 0.66
October	58.40	59.30	- 0.90	57.63	58.30	- 0.67	56.62	57.13	- 0.51	55.57	56.03	- 0.46
November . . .	64.01	64.90	- 0.89	62.90	63.40	- 0.50	61.11	61.43	- 0.32	58.99	59.11	- 0.12
December . . .	68.94	68.62	+ 0.32	67.39	67.18	+ 0.21	65.26	65.25	+ 0.01	62.30	62.34	- 0.04
January	73.08	72.99	+ 0.09	71.37	71.42	- 0.05	69.18	69.04	+ 0.14	65.67	65.55	+ 0.12
February	74.16	72.25	+ 1.91	73.07	71.66	+ 1.41	71.55	70.61	+ 0.94	68.23	67.63	+ 0.60
Year		60.49			60.20			60.63			60.14	

By Bessel's interpolation formula we derived from the above table the equations expressing the annual march of temperature at various depths. For the sake of comparison we repeat also the formulae for temperature of air ($T^{(n)}$) and of the soil at the surface ($T_0^{(n)}$).

$$\begin{aligned}
 \text{for Temp. of air} \quad \dots T^{(n)} &= 57.832 + 9.486 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 41^\circ 31' \right\} + 0.849 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 238^\circ 32' \right\} \\
 &\quad + 0.088 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 0^\circ 46' \right\} + \dots \\
 \text{" " of surf.-soil} \quad \dots T_0^{(n)} &= 61.523 + 13.776 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 47^\circ 27' \right\} + 0.884 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 249^\circ 39' \right\} \\
 &\quad + 0.357 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 138.45' \right\} + \dots \\
 \text{" " 14" deep} \quad \dots T_{14}^{(n)} &= 60.49 + 12.873 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 34^\circ 19' \right\} + 1.066 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 281^\circ 23' \right\} \\
 &\quad + 0.576 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 197^\circ 37' \right\} + \dots \\
 \text{" " 31" " " } \quad \dots T_{31}^{(n)} &= 60.20 + 12.425 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 28^\circ 17' \right\} + 0.888 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 231^\circ 41' \right\} \\
 &\quad + 0.489 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 202^\circ 59' \right\} + \dots \\
 \text{" " 65" " " } \quad \dots T_{65}^{(n)} &= 60.65 + 10.427 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 17^\circ 29' \right\} + 0.730 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 226^\circ 7' \right\} \\
 &\quad + 0.351 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 187^\circ 55' \right\} + \dots \\
 \text{" " 100" " " } \quad \dots T_{100}^{(n)} &= 60.14 + 8.212 \sin \left\{ (n + \frac{1}{2}) 30^\circ + 4^\circ 25' \right\} + 0.558 \sin \left\{ (n + \frac{1}{2}) 60^\circ + 189^\circ 4' \right\} \\
 &\quad + 0.277 \sin \left\{ (n + \frac{1}{2}) 90^\circ + 190^\circ 14' \right\} + \dots
 \end{aligned}$$

The monthly means for the various depths have been computed and the results are to be found in the above table, as also the differences between the values calculated and those observed. These differences show that the observed means are in excess of the calculated ones from June to November, and that the reverse is the case from December to May, the mean probable error being for 14": ± 0.597 , for 31": ± 0.565 , for 65": ± 0.416 and for 100": ± 0.318 . The fact, that the algebraic signs are in every one of the four cases confined to a certain period, seems to point for a plausible reason to some influence of the surface water.

For the purpose of determining the tropical points and the corresponding extremes in the above delineated annual march of the temperature of the ground at various depths, we undertook a further discussion of the equations. The results are contained in the subjoined table together with the tropical points for temperature of air and surface soil.

	MAXIMUM		MINIMUM	
	Time	Value	Time	Value
for Temp. of air	th 29·5 of Jan.	—	th 12·5 of July	—
„ surface soil	19·8 „ „	—	7·0 „ „	—
„ 14" deep	6·6 „ Febr.	74·35	25·9 „ „	48·15
„ 31" „	11·9 „ „	73·09	29·8 „ „	47·46
„ 65" „	20·0 „ „	71·63	9·5 „ Aug.	50·10
„ 100" „	1·7 „ March	68·69	20·6 „ „	51·60

48. Diurnal Fluctuation of Temperature of surface soil.

HOUR.	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Year
Midnight	60·87	54·12	49·80	45·78	44·06	46·51	48·36	52·83	56·80	59·57	62·93	61·84	53·62
1 ^h A M	60·12	53·56	49·47	45·49	43·68	46·14	47·73	52·26	56·01	58·65	62·04	61·10	53·02
2	59·55	53·55	48·99	45·08	43·28	45·74	47·18	51·63	55·40	57·74	61·16	60·37	52·47
3	59·00	52·55	48·65	44·72	43·06	45·43	46·64	51·08	54·65	57·04	60·40	59·36	51·88
4	58·50	52·12	48·50	44·50	42·88	45·21	46·27	50·71	54·10	56·51	59·81	59·24	51·53
5	58·15	51·94	48·40	44·38	42·74	44·92	45·83	50·40	54·25	56·80	59·70	58·79	51·36
6	57·79	51·91	48·30	44·28	42·46	44·77	45·63	51·40	56·86	60·17	62·58	59·20	52·11
7	60·48	52·98	48·44	44·34	42·38	45·08	48·26	55·89	63·41	66·65	68·32	63·09	54·94
8	66·81	57·34	50·46	45·28	43·66	47·40	53·24	61·65	70·87	73·94	75·63	69·88	59·68
9	74·68	63·00	54·23	48·11	46·74	51·36	59·12	68·03	76·76	81·07	83·32	78·33	65·40
10	81·70	68·18	58·57	51·87	50·58	56·02	63·65	73·78	83·18	86·89	89·46	85·09	70·75
11	88·43	72·81	61·86	55·64	54·21	60·20	68·29	77·61	88·86	91·77	94·85	90·67	75·43
Noon	92·02	75·29	63·61	57·85	56·52	63·24	71·24	80·57	92·92	95·34	98·52	94·38	78·46
1 ^h P M	93·68	76·12	63·88	57·99	56·77	64·65	72·37	82·80	93·41	95·87	98·56	96·49	79·38
2	92·02	75·99	63·61	57·66	56·80	63·78	71·48	80·42	91·45	95·87	98·01	96·56	78·64
3	87·94	73·49	60·15	54·92	53·41	61·31	68·55	78·01	87·04	92·34	95·49	92·89	75·46
4	83·49	69·42	57·82	52·60	50·75	57·92	64·39	73·00	81·44	88·72	90·11	87·69	71·45
5	76·79	64·10	54·93	50·24	48·46	53·60	59·72	67·98	75·82	81·18	83·97	82·22	66·58
6	70·13	60·35	53·43	49·30	47·12	50·84	55·58	62·40	68·91	73·37	76·96	75·49	61·99
7	67·14	58·76	52·56	48·39	46·41	49·59	53·35	59·08	64·17	68·38	71·62	69·24	59·06
8	65·34	57·39	51·76	47·70	45·83	48·66	52·08	57·33	61·89	65·37	68·22	66·90	57·37
9	63·91	56·38	50·98	47·02	45·26	48·00	50·93	55·89	60·38	63·54	66·33	65·11	56·14
10	62·61	55·45	50·46	46·60	44·89	47·38	50·15	54·94	59·13	62·04	65·00	63·85	55·21
11	61·74	54·64	49·97	46·02	44·46	46·92	49·15	53·79	57·88	60·86	63·76	62·69	54·32

By treating the above values according to Bessel's interpolation series, we obtain these equations:

$$\begin{aligned}
 \text{For March } T_o^{(n)} &= 70.95 + 16.243 \sin(n 15^\circ + 66^\circ 15') + 6.434 \sin(n 30^\circ + 68^\circ 14') \\
 &\quad + 0.898 \sin(n 45^\circ + 85^\circ 25') + \dots \\
 \text{,, April } &= 60.89 + 11.124 \sin(n 15^\circ + 64^\circ 45') + 4.596 \sin(n 30^\circ + 67^\circ 41') \\
 &\quad + 0.742 \sin(n 45^\circ + 78^\circ 16') + \dots \\
 \text{,, May } &= 53.70 + 6.795 \sin(n 15^\circ + 65^\circ 5') + 3.188 \sin(n 30^\circ + 71^\circ 29') \\
 &\quad + 1.028 \sin(n 45^\circ + 83^\circ 12') + \dots \\
 \text{,, June } &= 48.99 + 5.783 \sin(n 15^\circ + 60^\circ 10') + 2.823 \sin(n 30^\circ + 66^\circ 17') \\
 &\quad + 1.109 \sin(n 45^\circ + 73^\circ 36') + \dots \\
 \text{,, July } &= 47.35 + 5.945 \sin(n 15^\circ + 61^\circ 41') + 3.052 \sin(n 30^\circ + 67^\circ 17') \\
 &\quad + 1.185 \sin(n 45^\circ + 69^\circ 48') + \dots \\
 \text{,, August } &= 51.44 + 8.487 \sin(n 15^\circ + 63^\circ 15') + 4.005 \sin(n 30^\circ + 61^\circ 59') \\
 &\quad + 1.082 \sin(n 45^\circ + 59^\circ 46') + \dots \\
 \text{,, September } &= 55.80 + 11.997 \sin(n 15^\circ + 65^\circ 31') + 4.640 \sin(n 30^\circ + 71^\circ 56') \\
 &\quad + 0.594 \sin(n 45^\circ + 81^\circ 46') + \dots \\
 \text{,, October } &= 62.65 + 14.834 \sin(n 15^\circ + 68^\circ 58') + 4.951 \sin(n 30^\circ + 74^\circ 42') \\
 &\quad + 0.154 \sin(n 45^\circ + 73^\circ 20') + \dots \\
 \text{,, November } &= 69.40 + 18.586 \sin(n 15^\circ + 72^\circ 7') + 5.755 \sin(n 30^\circ + 78^\circ 45') \\
 &\quad + 0.088 \sin(n 45^\circ + 271^\circ 5') + \dots \\
 \text{,, December } &= 72.90 + 19.478 \sin(n 15^\circ + 70^\circ 4') + 5.178 \sin(n 30^\circ + 74^\circ 43') \\
 &\quad + 0.858 \sin(n 45^\circ + 262^\circ 25') + \dots \\
 \text{,, January } &= 75.70 + 19.150 \sin(n 15^\circ + 69^\circ 19') + 5.444 \sin(n 30^\circ + 73^\circ 36') \\
 &\quad + 0.645 \sin(n 45^\circ + 230^\circ 30') + \dots \\
 \text{,, February } &= 73.35 + 18.052 \sin(n 15^\circ + 65^\circ 15') + 6.060 \sin(n 30^\circ + 63^\circ 41') \\
 &\quad + 0.228 \sin(n 45^\circ + 166^\circ 28') + \dots \\
 \text{,, the Year } &= 61.93 + 13.025 \sin(n 15^\circ + 67^\circ 11') + 4.661 \sin(n 30^\circ + 70^\circ 29') \\
 &\quad + 0.446 \sin(n 45^\circ + 80^\circ 12') + \dots
 \end{aligned}$$

Table shewing the Difference between the observed and calculated values of the Diurnal fluctuation of Temperature of Surface Soil
(calculated minus observed values).

HOUR	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Febr.	Year
Midnight	+0.29	+0.23	-0.26	-0.29	-0.24	-0.05	+0.33	+0.60	+0.64	+0.87	+0.57	+0.50	+0.25
1 ^h A M	+0.47	+0.31	-0.15	-0.25	-0.16	-0.06	+0.29	+0.29	+0.34	+0.53	+0.52	+0.63	+0.23
2	+0.23	-0.26	+0.21	+0.10	+0.15	+0.09	+0.04	-0.15	-0.38	-0.23	-0.04	+0.26	+0.01
3	-0.22	+0.03	+0.32	+0.36	+0.28	+0.11	-0.27	-0.69	-0.73	-0.94	-0.68	-0.07	-0.19
4	-0.67	-0.25	+0.03	+0.24	+0.13	-0.07	-0.59	-0.70	-0.43	-0.69	-0.71	-0.97	-0.39
5	-0.67	-0.43	-0.36	-0.17	-0.24	-0.20	-0.27	+0.18	+0.67	+0.63	+0.43	-0.46	-0.69
6	+0.71	+0.13	-0.36	-0.44	-0.33	-0.15	+0.89	+1.19	+1.19	+0.98	+0.72	+0.94	+0.46
7	+1.05	+0.97	+0.33	-0.17	+0.07	+0.35	+0.68	+0.34	-0.33	+0.08	+0.25	+0.96	+0.38
8	-0.04	+0.10	+0.43	+0.39	+0.32	+0.18	-0.31	-0.36	-1.27	-0.49	-0.27	+0.03	-0.11
9	-0.91	-0.72	-0.02	+0.28	+0.06	-0.19	-1.02	-0.80	-0.15	-0.60	-0.63	-1.30	-0.47
10	-0.30	-0.49	-0.45	+0.03	-0.13	-0.33	0.00	-0.58	+0.63	-0.02	+0.07	-0.71	-0.18
11	-0.25	-0.21	-0.20	-0.35	-0.18	-0.03	+0.24	+0.59	+0.42	+0.22	+0.10	+0.11	+0.08
Noon	+0.68	+0.64	+0.29	-0.20	-0.02	+0.26	+0.49	+0.86	-0.28	+0.02	-0.18	-0.16	+0.31
1 ^h P M	+0.37	+0.89	+0.44	+0.37	+0.47	+0.15	+0.29	-0.47	-0.06	+0.77	+0.86	+0.58	+0.39
2	+0.20	-0.22	-0.63	-0.30	-0.63	+0.07	-0.20	+0.44	-0.09	-0.22	+0.13	-0.41	-0.16
3	-0.04	-0.79	+0.30	+0.26	+0.31	-0.21	-0.44	-0.56	+0.08	+0.08	-0.73	-0.10	-0.17
4	-1.26	-0.73	-0.21	+0.02	+0.16	-0.46	-0.38	-0.23	-0.01	-1.38	-0.33	-0.04	-0.43
5	-0.33	+0.55	+0.21	+0.19	+0.04	+0.32	+0.12	-0.22	-0.60	-0.09	-0.20	-0.57	-0.05
6	+1.31	+0.89	-0.01	-0.32	-0.17	+0.34	+0.68	+0.75	+0.56	+1.28	+0.70	+0.21	+0.52
7	+0.49	-0.03	-0.17	-0.20	-0.22	-0.14	+0.23	+0.41	+0.65	+0.67	+0.63	+1.31	+0.32
8	-0.31	-0.33	-0.03	+0.05	+0.01	-0.16	-0.31	-0.36	-0.27	-0.40	-0.06	-0.19	-0.18
9	-0.56	-0.38	+0.19	+0.29	+0.28	-0.05	-0.31	-0.44	-0.63	-0.93	-0.70	-0.82	-0.33
10	-0.27	-0.14	+0.08	+0.10	+0.14	+0.09	-0.28	-0.32	-0.34	-0.47	-0.57	-0.75	-0.22
11	-0.06	+0.16	-0.01	+0.01	-0.09	+0.03	+0.12	+0.27	+0.30	+0.23	+0.19	-0.05	+0.09

From the above differences we may arrive at the conclusion, that the proposed equations are in close accordance with the actual fluctuations in the temperature of soil at the surface.

It remains now to determine the tropical hours and the respective extremes, which task was carried out and the results embodied in the subjoined table:

Diurnal extremes in Temperature of surface soil (1858—63).

MONTHS	MAXIMUM		MINIMUM		MONTHS	MAXIMUM		MINIMUM	
	Time P M	Value	Time A M	Value		Time P M	Value	Time A M	Value
	h m	°	h m	°		h m	°	h m	°
March	12 55	94.06	4 34	57.47	September	12 53	72.67	4 39	45.50
April	12 57	77.02	5 0	51.51	October	12 52	82.34	4 1	50.01
May	12 43	64.40	5 40	47.89	November	12 47	93.39	3 43	53.62
June	12 54	58.38	6 9	43.83	December	1 4	96.64	3 41	55.73
July	12 53	57.26	6 10	42.12	January	12 57	99.42	3 55	59.10
August	1 4	64.81	5 40	44.59	February	1 9	97.10	4 19	58.12
Year	12 55	79.79	4 22	51.09					

The four tables below are calculated to illustrate the extent of the diurnal oscillations, both with respect to the amount and depth to which they are observable. On examining the various results somewhat closer it becomes evident, that the slight oscillations (if we may call them so) in the three-hourly means of the thermometer-readings at 31, 65 and 100, are to a great measure due to the effects of temperature on the mercurial column above and near the surface of the ground. The coincidence of the extremes in temperature, indicated by the ground-thermometers and the thermometer in open air, proves this quite clearly. As it is by no means likely that any diurnal motion is perceivable below 45 inch., the results obtained by the aid of the thermometers in 65 and 100 inch. might have served for the purpose of determining the amount of the influence above pointed out. We preferred, however, to abstain from applying any such correction, leaving the matter to those more immediately interested in this branch of physical science. So much we may be allowed to assert that, if the diurnal fluctuation extend to 31 inch., their amount must be so trifling as to be swamped by the changes in temperature due to the above mentioned effects.

Diurnal Fluctuation of Temperature of Soil.

14. inches below surface.

1861-63.	2h	5h	8h	11h	2h	5h	8h	11h	Mean.
	a. m.	a. m.	a. m.	a. m.	p. m.	p. m.	p. m.	p. m.	
March	70.41	69.86	69.35	69.21	69.42	69.81	70.36	70.49	69.86
April	61.24	60.28	60.48	60.63	61.85	61.22	61.89	62.07	61.08
May	55.51	54.74	54.36	54.26	54.75	54.84	55.39	55.31	54.89
June	50.75	50.54	50.08	50.50	50.29	50.51	50.89	50.80	50.54
July	48.71	48.50	48.05	48.07	48.28	48.49	48.70	48.83	48.45
August	49.62	49.34	48.93	48.79	49.00	49.48	49.62	49.81	49.32
September	54.05	53.64	53.27	53.12	53.35	53.74	54.17	54.55	53.74
October	59.41	59.08	58.94	58.73	58.91	59.43	59.87	60.03	59.30
November	64.97	64.60	64.28	64.17	64.51	65.08	65.63	66.00	64.90
December	68.94	68.40	67.92	67.78	68.16	68.71	69.39	69.63	68.62
January	73.40	72.84	72.39	72.22	72.63	73.13	73.59	73.77	72.99
February	72.63	72.19	71.83	71.73	71.93	72.29	72.67	72.72	72.25
Year	60.80	60.33	59.99	59.93	60.17	60.56	61.01	61.17	60.49

31. inches below surface.

1861-63.	2h	5h	8h	11h	2h	5h	8h	11h	Mean.
	a. m.	a. m.	a. m.	a. m.	p. m.	p. m.	p. m.	p. m.	
March	69.91	69.93	70.00	70.14	70.09	70.08	70.01	69.93	70.01
April	62.99	62.87	62.88	62.89	62.85	62.78	62.94	62.51	62.84
May	56.50	56.24	56.36	56.63	56.31	56.61	56.39	56.27	56.41
June	51.31	51.24	51.34	51.43	51.37	51.37	51.32	51.13	51.31
July	48.47	48.45	48.48	48.45	48.34	48.64	48.40	48.40	48.45
August	48.43	48.57	48.11	48.62	48.65	48.59	48.68	48.63	48.53
September	52.85	52.92	52.99	53.00	53.05	52.98	52.83	52.85	52.93
October	58.02	58.00	58.40	58.55	58.48	58.42	58.34	58.18	58.30
November	63.23	63.33	63.28	63.55	63.57	63.45	63.45	63.33	63.40
December	67.03	67.14	67.20	67.32	67.20	67.17	67.16	67.20	67.18
January	71.16	71.26	71.21	71.35	71.42	71.40	72.29	71.25	71.42
February	71.46	71.63	71.74	71.87	71.76	71.69	71.67	71.45	71.66
Year	60.11	60.13	60.16	60.32	60.26	60.26	60.29	60.09	60.20

65. inches below surface.

1861-63.	2h	5h	8h	11h	2h	5h	8h	11h	Mean.
	a. m.	a. m.	a. m.	a. m.	p. m.	p. m.	p. m.	p. m.	
March	70.06	70.02	70.02	70.05	70.08	70.09	70.06	70.03	70.05
April	65.01	64.97	64.85	64.94	64.98	64.88	64.96	64.71	64.91
May	59.51	59.42	59.45	59.46	59.49	59.57	59.47	59.39	59.47
June	54.71	54.63	54.65	54.67	54.71	54.66	54.51	54.55	54.64
July	51.58	51.57	51.59	51.58	51.51	51.55	51.48	51.48	51.54
August	50.48	50.53	50.48	50.52	50.51	50.53	50.65	50.62	50.54
September	53.14	53.31	53.24	53.28	53.22	53.32	53.22	53.25	53.24
October	56.90	56.99	57.17	57.24	57.23	57.27	57.17	57.09	57.13
November	61.34	61.36	61.44	61.52	61.57	61.45	61.39	61.40	61.43
December	65.13	65.23	65.25	65.35	65.31	65.27	65.23	65.25	65.25
January	69.01	69.07	68.96	69.12	69.15	69.11	69.05	68.82	69.04
February	70.52	70.55	70.61	70.74	70.72	70.64	70.58	70.45	70.61
Year	60.62	60.64	60.64	60.71	60.71	60.69	60.65	60.58	60.65

100. inches below surface.

1861-63.	2h	5h	8h	11h	2h	5h	8h	11h	Mean.
	a. m.	a. m.	a. m.	a. m.	p. m.	p. m.	p. m.	p. m.	
March	68.04	68.03	67.84	68.10	68.11	68.15	68.08	68.06	68.05
April	65.39	65.34	65.30	65.37	65.35	65.38	65.36	65.31	65.35
May	61.60	61.44	61.45	61.48	61.47	61.62	61.52	61.44	61.50
June	57.13	57.10	56.92	57.18	57.19	57.16	57.14	57.03	57.11
July	54.23	54.24	54.07	54.15	54.13	54.10	54.01	53.66	54.07
August	51.66	51.74	51.77	51.78	51.59	51.77	51.79	51.84	51.74
September	53.14	53.14	53.18	53.31	53.31	53.35	53.19	53.35	53.25
October	55.86	55.89	56.01	56.06	56.14	56.15	56.19	55.97	56.03
November	59.03	59.13	58.92	59.21	59.25	59.20	59.13	59.00	59.11
December	62.22	62.30	62.31	62.39	62.37	62.49	62.31	62.32	62.34
January	65.46	65.51	65.46	65.60	65.61	65.64	65.57	65.56	65.55
February	67.53	67.57	67.58	67.74	67.73	67.70	67.65	67.52	67.63
Year	60.11	60.12	60.07	60.20	60.19	60.22	60.16	60.09	60.14

49. Range in temperature of surface soil. In conjunction with the tables and formulae treating on the hourly variation of the temperature of the soil at the surface, the results of the following little table will be found exceedingly useful. They illustrate to what violent oscillations the temperature of soil is subjected.

1858—63.	MEAN RANGE		1858—63.	MEAN RANGE	
	daily.	monthly.		daily.	monthly.
March . . .	40·42	74·57	June . . .	16·69	33·06
April . . .	28·27	63·21	July . . .	17·50	33·66
May . . .	19·63	43·85	August . .	23·17	48·14
Autumn . .	29·442	60·5453	Winter . .	19·118	38·285
September .	30·64	53·89	December .	44·24	76·80
October . .	36·59	68·72	January . .	45·28	80·70
November .	45·01	77·97	February . .	41·45	75·30
Spring . .	37·414	66·859	Summer . .	43·657	77·601
Year . . .	32·408	60·823	M. Yearly R. 109·2.		
R. during the entire Period of obs. 108·9			Min. $\frac{3·3}{VII}$ 58.		
			Max. $\frac{5·5}{II}$ 59.		

IX. AQUEOUS METEORS.

A. RAIN.

50. The instruments and methods used in effecting the observations on the fall of rain have been fully described in former publications (R I. pag. 3 and R II pag. 4), and it does not appear incumbent upon us to dwell any further on this subject in order to cause the facts contained in these paragraphs to be fully understood and appreciated. It is, however, not out of place here to mention that the standard rain gauge of the observatory was on frequent occasions compared with other instruments, constructed for the same purpose but on a different principle; for instance with a rain gauge similar to those used at the meteorological stations of the Royal Engineers, with another according to the instructions of the Royal Society &c. The various instruments were for this purpose mounted close to each other in such a manner that their receiving openings were in one and the same level, at equal distances from the ground. In this way it was ascertained that the amounts registered by the aid of the standard-gauge invariably tallied with the average amounts deduced from all instruments, no matter how much the single results may have differed among each other.

As already described, the receiver of the standard gauge was of a square form, the sides being fixed in a direction parallel and perpendicular to the meridian, so as to cause the diagonals to run S.W. — N.E. and S.E. — N.W. With a view to determine the rainfall during day and night separately, the instrument was read at 6^h in the morning and evening; occasionally, when circumstances would make it desirable, registrations at shorter intervals were effected. The greatest attention was bestowed on the determination of the duration of rain, the values given at the time of registration indicating the fractions of the preceding hour during which rain descended. Both, duration and amount of rain, afford an opportunity for deciding upon

a unit for the intensity of the rain. $I = \frac{A}{D}$ signifies that the intensity is equal to the amount collected during one hour of rain. By multiplying the results, thus obtained, by 100 we receive the amounts for 100 hours of rain, and the values for intensity of rain, spoken of in these paragraphs, are understood to be the results of such a procedure. So is, for instance, the mean intensity for the whole year equal to 4.791, which signifies that during 100 hours of rain on an average 4.791 inches were collected.

The subjoined table illustrates the distribution of rain during the entire period of observation. For particulars may be referred to chapters V, R. I and R. II.

1858—63.		18 $\frac{5}{8}$			18 $\frac{5}{8}$			18 $\frac{6}{8}$			18 $\frac{6}{8}$			18 $\frac{6}{8}$			Means for 18 $\frac{5}{8}$		
		Amount.	Duration.	Intens.	Amount.	Duration.	Intens.	Amount.	Duration.	Intens.	Amount.	Duration.	Intens.	Amount.	Duration.	Intens.	Amount.	Duration.	Intens.
AUTUMN.	Day	1.763	51.35	3.4	1.831	37.00	4.9	3.784	63.85	5.9	3.163	61.60	5.1	3.823	63.00	6.1	2.8723	55.36	5.19
	Night	1.312	49.20	2.7	1.952	49.25	4.0	2.699	52.85	5.1	1.610	51.40	3.1	5.121	102.05	5.0	2.5388	60.95	4.16
	Total	3.075	100.55	3.1	3.783	86.25	4.4	6.483	116.70	5.6	4.773	113.00	4.2	8.944	165.05	5.4	5.4116	116.31	4.65
WINTER.	Day	2.553	82.95	3.1	3.461	88.70	3.9	1.726	50.35	3.4	2.081	68.30	3.0	3.622	92.20	3.9	2.6886	76.50	3.51
	Night	1.895	107.65	1.8	3.038	86.35	3.5	1.989	57.15	3.5	3.307	88.60	3.7	3.582	86.50	4.1	2.7622	85.25	3.24
	Total	4.448	190.60	2.3	6.499	175.05	3.7	3.715	107.50	3.5	5.388	156.90	3.4	7.204	178.70	4.0	5.4508	161.75	3.37
SPRING.	Day	3.551	67.46	5.3	3.074	58.45	5.3	3.747	63.60	5.9	4.172	68.41	6.1	1.380	29.38	4.7	3.1848	57.46	5.54
	Night	2.680	68.55	3.9	3.735	86.55	4.3	3.327	71.05	4.7	5.365	68.60	7.8	1.944	34.68	5.6	3.4102	65.92	5.17
	Total	6.231	136.01	4.6	6.809	145.00	4.7	7.074	134.65	5.3	9.537	137.01	7.0	3.324	64.24	5.2	6.3950	123.38	5.34
SUMMER.	Day	5.777	66.80	8.6	1.576	25.90	6.1	7.945	91.96	8.6	2.263	32.15	7.0	2.041	49.20	4.1	3.9204	53.20	7.37
	Night	4.383	69.40	6.3	2.492	43.20	5.8	3.981	90.27	4.4	1.761	29.50	6.0	3.697	65.70	5.6	3.2628	59.61	5.48
	Total	10.160	136.20	7.5	4.068	69.10	5.9	11.926	182.23	6.5	4.024	61.65	6.5	5.738	114.90	5.0	7.1830	112.81	6.37
YEAR.	Day	13.644	268.56	5.1	9.942	210.05	4.7	17.202	269.76	6.4	11.679	230.46	5.1	10.866	233.78	4.6	12.6666	242.52	5.223
	Night	10.270	294.80	3.5	11.217	265.35	4.2	11.996	271.32	4.4	12.043	238.10	5.1	14.344	289.11	5.0	11.9736	271.74	4.406
	Total	23.914	563.36	4.2	21.159	475.40	4.5	29.198	541.08	5.4	23.722	468.56	5.1	25.210	522.89	4.8	24.6402	514.26	4.791

Note: The total intensity has in every case been computed from the total amount and duration, and is not simply the mean derived from intensity of day and night.

51. Distribution of rain throughout the year. Although the above table gives the principal features of the annual variation in amount, duration and intensity of rain, it is quite indispensable to become acquainted with the various peculiarities of this important meteorological element within shorter periods, in order to be able to fully understand all phenomena connected with this matter. The following tables will be found very useful for this purpose. This, as well as the one in the last paragraph, is derived from the various Tables in R. I, 71 and R. II, pag. 119.

1858—63.		AMOUNT.			DURATION.			INTENSITY			1858—63.		AMOUNT.			DURATION.			INTENSITY		
		Day	Night	Total	Day	Night	Total	Day	Night	Total			Day	Night	Total	Day	Night	Total	Day	Night	Total
March April May June July August	inch.	0.7774	0.4134	1.1908	13.22	11.92	25.14	5.9	3.5	4.7	September October November December January February	inch.	1.2982	1.0688	2.3670	27.49	24.88	52.37	4.7	4.3	4.5
	inch.	1.1032	1.1484	2.2516	21.93	22.04	43.97	5.0	5.2	5.1		inch.	1.1472	1.2698	2.4170	16.85	24.94	41.79	6.8	5.1	5.8
	inch.	0.9922	0.9770	1.9692	20.21	26.99	47.20	4.9	3.6	4.2		inch.	0.7394	1.0716	1.8110	13.12	16.10	29.22	5.6	6.7	6.2
	inch.	1.1550	1.1960	2.3510	29.54	30.32	59.86	3.9	3.9	3.9		inch.	1.6700	1.5906	3.2606	22.37	23.02	45.39	7.5	6.9	7.2
	inch.	0.8854	0.8572	1.7426	26.69	28.31	55.00	3.3	3.0	3.2		inch.	1.0122	1.0212	2.0334	13.45	16.92	30.38	7.5	6.0	6.7
	inch.	0.6482	0.7090	1.3572	20.27	26.62	46.89	3.2	2.7	2.9		inch.	1.2382	0.6510	1.8892	17.38	19.67	37.05	7.1	3.3	5.1
	hours.											hours.									
	hours.											hours.									

The annual mean rainfall is according to our tables 24·6402 inch., the mean duration 514·26 hours and the mean intensity 4·791.

A few remarks on the mean amount of rain may well find a place here. In another publication (catalogue of the Victorian Exhibition 1861 pag. 147) we have given an analysis of the records on the fall of rain at Melbourne since 1840 with but the interruption of four years (1851—54). Combining now the observations made at the Flagstaff Observatory with those made at the office of the Crownlands, we obtain as an average fall of rain for the period of 20 years 27·959 inches, in which mean value is also included the extraordinary large fall of rain during 1849, amounting to 44·25 inches. If we reject the result for this year, as rather abnormal, the mean annual rainfall is found to be 27·101 inches. From the series of observations just referred to it is evident that the average fall for any six consecutive years pretty fairly represents the general mean value for this meteorological factor. For the period from 1855—60 the mean fall of rain amounts to 26·679 inch., and for the period 1857—62 it is 25·447 inch. We notice that this latter value comprises the results for the period over which the observations, the object of these discussions, extend; and as it happens that the fall of rain for 1854 is at our command, we are further enabled to derive the mean fall of rain for the period 1858—63 to be 26·3345 inch., while for the seven years period 1857—63 we obtain an average value of 26·784 inch., but slightly differing from the mean annual fall for the 19 years, above mentioned. From the various facts just adduced we may safely conclude that the mean annual fall according to our table is about 1·8 inch. below the actual annual mean amount of rain.

With respect to the distribution of rain over the various seasons of the year it is not without interest to compare the results for our table (par. 50) with the means for the whole period from 1840—62. They are for autumn: 6·45, for winter: 6·09, for spring: 7·93 and for summer: 6·45.

The mean amounts of rain for five days, given in the next table, still further illustrate the distribution of rain throughout the year.

Mean Amount of Rain during five days for the years 1858 to 1863.

NUMBER OF THE PERIOD In the resp. MONTHS.	Jan.	Febr.	March.	April.	May.	June.	July.	Aug.	Sept.	Octbr.	Nov.	Dec.
	(1—5)	(31—4)	(2—6)	(1—5)	(1—5)	(31—4)	(5—9)	(4—8)	(3—7)	(3—7)	(2—6)	(2—6)
	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.	inches.
1	0·1470	0·7594	0·1968	0·5540	0·2020	0·3588	0·1912	0·2666	0·1986	0·3970	0·3460	0·5244
2	0·3350	0·0734	0·0183	0·1672	0·6812	0·2994	0·4166	0·2884	0·6588	0·5412	0·1760	1·0680
3	0·3758	0·1602	0·0505	0·3952	0·3004	0·3940	0·2616	0·2452	0·4770	0·2152	0·2746	0·5398
4	0·4900	0·5416	0·8208	0·7700	0·1440	0·2558	0·3370	0·2958	0·3292	0·1388	0·0988	0·7490
5	0·4086	0·1432	0·0878	0·2500	0·2794	0·2034	0·3444	0·1134	0·3194	0·3900	0·3880	0·2376
6	0·2790	0·2116	0·0420	0·1140	0·3604	0·5068	0·1922	0·1534	0·3808	0·7352	0·5268	0·1418
						0·3328						

52. Daily Duration of Rain throughout the year. The figures below denote the mean number of hours of rain for every day of the year, derived from 5 years observation.

ANNUAL MARCH OF DAILY DURATION OF RAIN.

(Mean for the year: ^{hour.}1.406).

1858-63		AUTUMN.			WINTER.			SPRING.			SUMMER.		
DAY OF MONTH.		March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.
		hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.
1 st		2.41	0.00	2.16	3.28	0.36	1.20	0.46	1.43	2.39	0.50	0.54	2.42
2 ^d		1.14	0.50	0.29	0.68	0.68	2.22	2.04	2.64	1.61	2.10	0.45	1.42
3 ^d		0.00	0.70	1.02	0.80	1.96	1.04	1.57	1.28	0.18	5.20	0.48	1.73
4 th		0.34	3.50	0.46	0.00	3.05	0.24	0.28	1.82	0.00	0.54	0.42	0.28
5 th		0.16	3.51	1.44	0.51	2.50	3.00	0.39	1.80	1.62	0.68	1.18	0.06
6 th		1.44	1.54	2.39	0.14	0.14	2.64	1.04	0.00	1.38	0.66	0.00	0.16
7 th		0.27	1.18	0.76	1.07	1.07	1.12	3.36	1.02	0.78	0.75	0.64	0.54
8 th		0.48	1.37	3.94	3.08	1.18	0.88	1.10	2.98	0.18	2.37	2.40	0.02
9 th		0.70	0.58	3.10	1.60	0.40	0.12	2.54	0.32	0.02	4.37	1.47	1.11
10 th		0.60	0.80	0.82	1.72	2.90	2.06	2.10	2.30	1.28	5.32	0.24	0.68
11 th		0.20	1.42	1.03	1.27	2.32	4.80	2.84	0.92	1.15	1.95	1.65	0.94
12 th		0.00	2.02	2.12	2.26	5.84	3.33	1.45	1.01	1.26	3.69	0.82	0.34
13 th		0.00	2.48	1.64	1.18	1.70	1.95	1.09	0.58	1.26	0.14	1.00	0.00
14 th		0.40	2.20	1.15	1.42	2.24	2.18	4.21	1.30	0.52	1.36	2.35	0.70
15 th		0.20	0.24	0.76	2.48	2.28	2.64	3.88	0.75	0.06	0.68	1.19	0.60
16 th		0.48	4.38	0.31	0.28	0.89	2.14	1.58	2.02	1.34	0.38	4.72	3.18
17 th		3.24	2.68	0.40	0.65	0.16	1.86	1.41	1.74	0.10	0.40	0.90	4.80
18 th		0.78	1.89	0.00	2.50	2.86	0.34	0.92	0.10	0.27	1.30	0.22	5.14
19 th		4.26	1.32	2.13	1.08	0.62	0.44	1.41	0.64	0.59	3.30	0.14	1.06
20 th		0.64	1.76	1.98	1.20	1.08	1.74	1.00	1.90	0.08	2.68	0.32	0.86
21 st		1.43	1.00	1.56	1.99	2.95	2.63	1.26	0.60	0.32	2.86	0.56	0.46
22 ^d		1.39	2.20	1.16	0.95	1.24	2.28	3.67	0.55	0.78	1.72	0.93	0.16
23 ^d		0.54	3.13	0.43	2.79	2.06	1.65	2.43	1.32	0.93	0.10	0.90	1.11
24 th		1.34	0.10	1.86	0.68	3.25	1.28	0.26	0.92	0.84	0.12	1.47	0.22
25 th		1.98	0.00	1.10	0.78	2.18	0.20	0.67	0.39	1.58	0.44	2.86	0.00
26 th		1.38	0.04	1.30	3.36	2.01	0.88	2.59	0.02	1.13	0.52	2.01	0.06
27 th		0.11	0.82	4.24	5.92	2.09	0.28	1.15	3.41	0.23	1.28	0.18	0.23
28 th		0.06	1.46	1.60	3.58	0.50	1.10	0.80	6.21	3.05	0.14	0.02	1.10
29 th		0.04	0.45	2.32	0.96	2.92	0.72	1.14	1.16	3.47	0.08	0.08	
30 th		0.70	0.70	3.73	0.27	2.10	1.33	2.16	1.40	2.70	0.00	0.20	
31 st		0.84		5.58		0.80	0.56		0.94		0.26	4.32	
MEANS.	observed	0.89	1.47	1.70	1.62	1.82	1.58	1.69	1.40	1.04	1.48	1.12	1.05
	calculated	0.97	1.39	1.72	1.70	1.66	1.74	1.64	1.33	1.20	1.31	1.24	0.96
	calc. - observ.	+0.08	-0.07	+0.01	+0.08	-0.16	+0.16	-0.06	-0.07	+0.17	-0.16	+0.13	-0.08
MEANS FOR THE QUARTERS.		1.351			1.670			1.378			1.221		

The monthly means were employed in forming an interpolation series according to Bessel's method. Here is the result:

$$H^{(n)} = 1.406 + 0.338 \sin \left\{ \left(n + \frac{1}{2} \right) 30^\circ + 217^\circ 37' \right\} + 0.102 \sin \left\{ \left(n + \frac{1}{2} \right) 60^\circ + 62^\circ 49' \right\} \\ + 0.147 \sin \left\{ \left(n + \frac{1}{2} \right) 90^\circ + 315^\circ 38' \right\} + \dots$$

By this formula were the daily durations computed for every month of the year. The results have been inserted in the above table beneath the observed values, and the differences show, that the proposed formula accords well with actual observation, the probable error amounting to only ± 0.103 hour.

A discussion of the above equation, with a view to determine the tropical points in the annual curve of daily duration of rain places the maximum on the 2^d of July and the minimum on the 18th of February.

53. Diurnal Fluctuation in Duration of Rain. Tables bearing upon this topic have been published in R. I pag. 60 and in the appendix Nr. 20 of this volume. In perusing the values in the subjoined tables it must be borne in mind that they, properly speaking, appertain to the middle of the hour preceding the one under which they appear.

Diurnal Fluctuation of Duration of Rain.

HOUR.	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Year
	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.
Midnight	0.040	0.065	0.048	0.073	0.070	0.090	0.074	0.067	0.025	0.068	0.060	0.051	0.061
1 ^h A M	0.049	0.075	0.058	0.078	0.063	0.091	0.053	0.069	0.043	0.071	0.050	0.055	0.063
2	0.027	0.054	0.060	0.068	0.094	0.106	0.058	0.095	0.038	0.067	0.043	0.060	0.064
3	0.016	0.060	0.073	0.076	0.099	0.081	0.053	0.093	0.045	0.052	0.057	0.043	0.062
4	0.021	0.059	0.065	0.075	0.084	0.078	0.043	0.113	0.054	0.043	0.049	0.048	0.061
5	0.035	0.047	0.054	0.069	0.076	0.060	0.049	0.087	0.044	0.051	0.037	0.054	0.055
6	0.056	0.042	0.060	0.063	0.083	0.087	0.057	0.071	0.027	0.066	0.045	0.048	0.059
7	0.047	0.080	0.079	0.064	0.092	0.062	0.062	0.058	0.030	0.066	0.074	0.054	0.064
8	0.073	0.069	0.045	0.075	0.090	0.081	0.077	0.054	0.037	0.058	0.043	0.054	0.063
9	0.045	0.074	0.031	0.078	0.115	0.047	0.064	0.059	0.046	0.057	0.051	0.045	0.059
10	0.061	0.067	0.064	0.081	0.062	0.038	0.054	0.044	0.031	0.051	0.032	0.047	0.053
11	0.034	0.063	0.044	0.087	0.048	0.057	0.064	0.049	0.038	0.063	0.031	0.030	0.051
Noon	0.022	0.069	0.059	0.066	0.055	0.047	0.065	0.046	0.025	0.046	0.037	0.032	0.047
1 ^h P M	0.016	0.041	0.042	0.050	0.059	0.019	0.074	0.055	0.019	0.051	0.038	0.042	0.042
2	0.016	0.048	0.056	0.055	0.083	0.046	0.072	0.055	0.039	0.050	0.040	0.036	0.050
3	0.019	0.060	0.089	0.049	0.102	0.048	0.104	0.031	0.041	0.056	0.033	0.039	0.056
4	0.024	0.049	0.085	0.052	0.087	0.056	0.092	0.030	0.032	0.074	0.037	0.047	0.055
5	0.033	0.054	0.080	0.057	0.069	0.064	0.081	0.039	0.048	0.058	0.038	0.039	0.055
6	0.023	0.044	0.094	0.045	0.059	0.069	0.093	0.046	0.043	0.062	0.042	0.044	0.055
7	0.025	0.047	0.110	0.057	0.058	0.085	0.083	0.066	0.040	0.073	0.038	0.060	0.062
8	0.028	0.067	0.100	0.045	0.078	0.065	0.079	0.051	0.024	0.066	0.049	0.041	0.058
9	0.015	0.061	0.089	0.081	0.077	0.055	0.089	0.084	0.016	0.061	0.046	0.057	0.061
10	0.011	0.060	0.068	0.074	0.068	0.074	0.067	0.073	0.024	0.062	0.046	0.042	0.056
11	0.028	0.064	0.072	0.057	0.059	0.076	0.079	0.078	0.027	0.068	0.052	0.037	0.058

The treatment of the above values according to the method of the least squares resulted in the following interpolation formulae.

For <i>March</i>	$H^{(n)} = 0.032 + 0.0131 \sin(n + 164^\circ 27') + 0.0090 \sin(n + 203^\circ 29')$ $+ 0.0109 \sin(n + 250^\circ 19') + \dots$
„ <i>April</i> . .	$= 0.059 + 0.0049 \sin(n + 193^\circ 48') + 0.0080 \sin(n + 145^\circ 39')$ $+ 0.0048 \sin(n + 239^\circ 53') + \dots$
„ <i>May</i> . .	$= 0.068 + 0.0189 \sin(n + 337^\circ 24') + 0.0136 \sin(n + 268^\circ 57')$ $+ 0.0041 \sin(n + 105^\circ 9') + \dots$
„ <i>June</i> . .	$= 0.066 + 0.0106 \sin(n + 193^\circ 10') + 0.0076 \sin(n + 132^\circ 19')$ $+ 0.0040 \sin(n + 165^\circ 41') + \dots$
„ <i>July</i> . .	$= 0.076 + 0.0082 \sin(n + 180^\circ 35') + 0.0089 \sin(n + 302^\circ 21')$ $+ 0.0078 \sin(n + 287^\circ 28') + \dots$
„ <i>August</i> .	$= 0.066 + 0.0217 \sin(n + 254^\circ 38') + 0.0048 \sin(n + 298^\circ 46')$ $+ 0.0083 \sin(n + 216^\circ 25') + \dots$
„ <i>September</i>	$= 0.070 + 0.0176 \sin(n + 11^\circ 28') + 0.0034 \sin(n + 239^\circ 2')$ $+ 0.0071 \sin(n + 292^\circ 56') + \dots$
„ <i>October</i> .	$= 0.063 + 0.0242 \sin(n + 235^\circ 23') + 0.0039 \sin(n + 7^\circ 26')$ $+ 0.0111 \sin(n + 78^\circ 16') + \dots$
„ <i>November</i>	$= 0.035 + 0.0030 \sin(n + 170^\circ 32') + 0.0078 \sin(n + 322^\circ 24')$ $+ 0.0069 \sin(n + 189^\circ 48') + \dots$
„ <i>December</i>	$= 0.060 + 0.0061 \sin(n + 306^\circ 5') + 0.0029 \sin(n + 205^\circ 7')$ $+ 0.0054 \sin(n + 254^\circ 54') + \dots$
„ <i>January</i>	$= 0.045 + 0.0083 \sin(n + 235^\circ 40') + 0.0022 \sin(n + 206^\circ 34')$ $+ 0.0040 \sin(n + 301^\circ 22') + \dots$
„ <i>February</i>	$= 0.046 + 0.0061 \sin(n + 239^\circ 34') + 0.0042 \sin(n + 256^\circ 14')$ $+ 0.0021 \sin(n + 237^\circ 15') + \dots$
„ <i>the Year</i>	$= 0.0572 + 0.0056 \sin(n + 245^\circ 21') + 0.0028 \sin(n + 249^\circ 27')$ $+ 0.0028 \sin(n + 238^\circ 10') + \dots$

According to these formulae we computed the values for diurnal fluctuation, and the sub-joined table contains the differences.

Table shewing the Difference between the observed and calculated values of the Diurnal fluctuation of Duration of Rain.
(calculated minus observed values).

HOURL.	During the years 1858 to 1863.												
	March	April	May	June	July	Aug.	Sept.	Octbr.	Novbr.	Decbr.	Jan.	Feb.	Year.
	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.
Midnight	-0.005	+0.004	+0.009	0.000	+0.006	-0.002	-0.004	+0.005	+0.006	+0.001	-0.006	-0.002	0.000
1h AM	-0.014	-0.008	-0.002	-0.003	+0.015	+0.002	+0.009	+0.010	-0.003	-0.004	+0.002	-0.005	0.000
2	+0.003	+0.007	0.000	+0.007	-0.016	-0.012	-0.006	-0.006	+0.008	-0.007	+0.006	-0.010	-0.001
3	+0.009	-0.005	-0.008	-0.003	-0.019	+0.007	-0.007	+0.004	+0.002	+0.003	-0.010	+0.008	-0.002
4	+0.005	-0.007	+0.003	-0.005	0.000	+0.003	+0.004	-0.014	-0.010	+0.009	-0.001	+0.002	-0.001
5	-0.003	+0.005	+0.013	-0.001	+0.013	+0.014	+0.002	+0.004	-0.005	+0.002	+0.013	-0.003	+0.005
6	-0.011	+0.015	+0.004	+0.003	+0.010	-0.018	-0.004	+0.008	+0.009	-0.010	+0.008	+0.004	+0.001
7	+0.010	-0.017	-0.022	+0.006	+0.003	+0.006	+0.002	+0.005	+0.005	-0.006	-0.020	-0.002	-0.002
8	-0.009	+0.001	+0.007	0.000	0.000	-0.015	-0.011	-0.004	-0.001	+0.004	+0.008	-0.005	-0.003
9	+0.016	0.000	+0.018	+0.001	-0.032	+0.014	+0.001	-0.013	-0.009	+0.005	-0.005	+0.002	0.000
10	-0.011	+0.003	-0.017	-0.001	+0.008	+0.016	+0.007	+0.004	+0.005	+0.006	+0.008	-0.004	+0.003
11	+0.011	+0.003	+0.004	-0.011	+0.014	-0.014	-0.004	+0.003	-0.005	-0.012	+0.005	+0.009	-0.001
Noon	-0.001	-0.010	-0.008	+0.005	+0.007	-0.011	-0.001	+0.008	+0.004	+0.003	-0.003	+0.003	0.000
1h PM	-0.001	+0.012	+0.014	+0.011	+0.007	+0.014	-0.002	-0.004	+0.009	-0.002	-0.004	-0.008	+0.003
2	0.000	+0.003	+0.006	-0.002	-0.009	-0.008	+0.010	-0.010	-0.009	+0.004	-0.003	0.000	-0.003
3	+0.004	-0.011	-0.018	0.000	-0.020	0.000	-0.014	+0.006	-0.006	+0.003	+0.006	0.000	-0.004
4	+0.004	+0.001	-0.003	-0.004	-0.003	+0.003	+0.001	+0.003	+0.010	-0.010	+0.003	-0.003	-0.001
5	-0.003	-0.002	+0.013	-0.007	+0.012	+0.004	+0.012	-0.002	-0.003	+0.009	+0.002	+0.008	+0.003
6	+0.004	+0.007	+0.006	+0.009	+0.014	+0.002	-0.006	+0.001	+0.001	+0.004	-0.003	+0.004	+0.005
7	-0.004	+0.006	-0.007	+0.001	+0.007	-0.015	-0.001	-0.007	-0.003	-0.009	+0.001	-0.012	-0.004
8	-0.010	-0.013	-0.002	+0.016	-0.016	+0.001	+0.001	+0.017	+0.004	-0.002	-0.006	+0.006	0.000
9	+0.004	-0.003	-0.002	-0.018	-0.016	+0.012	-0.010	-0.012	+0.005	+0.003	+0.002	-0.010	-0.004
10	+0.013	+0.004	+0.007	-0.008	-0.002	-0.004	+0.012	-0.001	-0.006	+0.005	+0.006	+0.007	+0.002
11	+0.003	+0.002	-0.008	+0.013	+0.013	+0.003	-0.003	-0.006	-0.004	+0.001	+0.002	+0.010	+0.002

A determination of the tropical hours and the corresponding values gave the following results:

Diurnal extremes in Duration of Rain.

MONTHS.	Maximum.		Minimum.		MONTHS.	Maximum.		Minimum.	
	time.	value.	time.	value.		time.	value.	time.	value.
March . . .	h m 8 16 a. m.	hour. 0.064	h m 1 20 p. m.	hour. 0.015	September* .	h m 4 9 p. m.	hour. 0.093	h m 3 27 a. m.	hour. 0.046
April . . .	9 4 a. m.	0.073	2 37 p. m.	0.049	October . . .	3 45 a. m.	0.099	4 2 p. m.	0.033
May . . .	6 49 p. m.	0.102	10 2 a. m.	0.047	November** .	5 13 p. m.	0.045	9 52 p. m.	0.019
June . . .	9 50 a. m.	0.080	3 42 p. m.	0.048	December . .	11 36 p. m.	0.069	12 23 p. m.	0.048
July* . . .	6 41 a. m.	0.095	11 41 p. m.	0.061	Jannary*** .	11 26 p. m.	0.055	12 14 p. m.	0.034
August . . .	1 32 a. m.	0.094	12 50 p. m.	0.033	February . . .	6 34 a. m.	0.052	12 48 p. m.	0.034
Year . . .	12 59 a. m.	0.065	1 50 p. m.	0.046	h m * In July occurs a second minimum 8 21 p. m., the value being the same as above. h m ** In November a second maximum 2 43 a. m., value 0.047. h m *** a second maximum 6 52 a. m. value 0.053.				

54. Influence of the wind's direction on the fall and duration of rain. The tables contained in this paragraph are based on facts already published in R. I, pag. 72,

73, R. II, pag. 120-124 and appendix Nr. 21 of this volume. The manner in which the observations for the original number of 32 points were reduced to values for only sixteen points, was fully explained in the introductory remarks, and does not require any further comment.

Mean number of hours of rain for the time the wind blew from each of sixteen points.
(During 1858-63).

	S.	Be- tween S. and S.E.	S.E.	Be- tween S.E. and E.	E.	Be- tween E. and N.E.	N.E.	Be- tween N.E. and N.	N.	Be- tween N. and N.W.	N.W.	Be- tween N.W. and W.	W.	Be- tween W. and S.W.	S.W.	Be- tween S.W. and S.	Calms.
March	2.50	1.42	0.79	0.81	1.20	2.95	1.95	0.60	0.53	1.80	0.76	0.74	2.77	3.67	2.00	2.57	2.43
April	2.17	2.77	3.47	1.53	0.31	0.94	2.41	2.42	1.30	2.20	1.76	3.58	5.85	6.14	2.23	3.60	1.10
May	2.43	1.64	1.52	0.32	0.44	1.15	3.30	6.69	4.28	4.05	4.20	4.04	4.65	5.77	2.97	1.95	2.62
1st Quarter	7.10	5.83	5.78	2.66	1.95	5.04	7.66	9.71	6.11	8.05	6.72	8.36	13.27	15.58	7.20	8.12	6.15
June	0.45	1.27	0.78	0.02	0.00	0.79	3.84	7.28	6.79	4.48	2.20	3.26	7.19	6.34	1.39	1.31	1.52
July	0.71	1.07	3.87	1.99	1.32	0.42	3.31	4.88	6.88	5.50	2.34	3.05	8.71	6.63	3.32	2.08	2.54
August	2.28	1.42	0.20	0.10	0.04	0.76	2.76	6.15	5.38	1.97	2.10	2.16	6.60	8.50	3.66	3.30	0.70
2nd Quarter	3.44	3.76	4.85	2.11	1.36	1.97	9.91	18.31	19.05	11.95	6.64	8.47	22.50	21.47	8.37	6.69	4.76
September	2.50	2.04	0.81	0.75	0.66	1.42	1.81	3.40	4.86	2.42	3.22	2.74	8.50	7.82	4.79	1.99	0.78
October	2.78	1.47	0.50	0.27	0.46	2.14	2.59	3.13	2.28	1.31	1.40	2.10	5.10	4.77	4.52	6.65	1.52
November	1.48	1.06	1.90	1.27	1.33	1.78	1.80	2.12	0.96	1.60	0.82	1.43	3.62	3.65	3.00	3.17	0.88
3rd Quarter	6.76	4.57	3.21	2.29	2.45	5.34	6.20	8.65	8.10	5.33	5.44	6.27	17.22	16.24	12.31	11.81	3.18
December	2.47	1.60	1.34	2.87	3.32	2.44	4.32	2.36	1.00	3.27	1.34	1.34	3.87	4.58	3.35	3.11	2.04
January	3.08	4.60	1.34	0.59	0.80	1.53	2.37	2.26	0.87	0.94	1.42	1.07	1.24	4.29	4.00	3.06	1.86
February	5.30	3.27	2.70	0.72	0.26	0.84	0.56	1.80	0.92	0.14	0.58	0.12	1.45	3.90	2.18	3.28	0.50
4th Quarter	10.85	9.47	5.38	4.18	4.38	4.81	7.25	6.42	2.79	4.35	3.34	2.53	6.56	12.77	9.53	9.45	4.40
Sums for the Year .	28.15	23.63	19.22	12.06	10.14	17.16	31.02	43.09	36.05	29.68	22.14	25.63	59.55	66.06	37.41	36.07	18.49

It is evident that the values of the above table are still influenced by the frequency of each resp. wind, and in order to obtain values, expressing the character of each wind with special regard to rain, we propose dividing those values by the corresponding number of hours the wind blew from a certain point of the compass (table par. 2). By this process we receive the number of hours of rain for one hour the wind blew from each point of the compass, and by multiplying the results thus obtained we arrive at the values of the next table.

Number of hours of rain for every ten hours of wind from each point.
(During 1858—1863.)

	S.	Be- tween S. and S.E.	S.E.	Be- tween S.E. and E.	E.	Be- tween E. and N.E.	N.E.	Be- tween N.E. and N.	N.	Be- tween N. and N.W.	N.W.	Be- tween N.W. and W.	W.	Be- tween W. and S.W.	S.W.	Be- tween S.W. and S.	Calms.
March	0.292	0.228	0.182	0.266	0.521	0.726	0.349	0.130	0.159	0.562	0.314	0.258	0.706	0.787	0.510	0.300	0.964
April	0.441	0.629	1.134	0.750	0.254	0.364	0.301	0.324	0.243	0.506	0.599	0.947	1.064	1.268	0.729	0.732	0.329
May	1.464	0.921	1.117	0.421	0.550	0.605	0.454	0.538	0.464	0.929	0.727	0.610	0.729	1.197	1.928	1.083	0.936
June	0.212	0.588	0.513	0.025	0.000	0.232	0.386	0.576	0.544	0.665	0.748	1.079	1.853	1.751	0.993	0.662	0.655
July	0.378	0.891	1.954	2.261	1.178	0.238	0.425	0.400	0.563	0.836	0.539	0.719	1.336	1.916	2.024	0.825	0.661
August	0.832	0.825	0.145	0.128	0.060	0.290	0.297	0.576	0.559	0.452	0.596	0.545	1.012	1.512	0.867	0.988	0.217
September	0.668	0.879	0.431	0.605	0.673	0.441	0.227	0.405	0.604	0.446	0.626	0.652	1.384	1.527	1.787	0.513	0.609
October	0.420	0.343	0.172	0.175	0.396	0.823	0.469	0.484	0.404	0.256	0.387	0.739	1.032	1.089	1.032	0.638	0.730
November	0.207	0.205	0.508	0.418	0.747	0.701	0.422	0.469	0.225	0.610	0.315	0.522	0.739	0.668	0.566	0.308	0.454
December	0.267	0.230	0.340	0.859	1.596	0.865	1.102	0.628	0.231	0.950	0.573	0.604	0.896	0.958	0.817	0.314	0.843
January	0.359	0.537	0.320	0.178	0.459	0.593	0.601	0.588	0.212	0.402	0.855	0.393	0.304	0.819	0.917	0.273	1.081
February	0.590	1.879	0.538	0.149	0.240	0.424	0.180	0.625	0.305	0.070	0.420	0.066	0.437	0.851	0.464	0.326	0.202

These figures were again combined into quarters and the resulting fractions of an hour expressed in minutes, thus becoming more handy for being thrown into curves.

Number of Minutes of Rain for one hour of wind from each of the sixteen points of the Compass.
(During 1858—1863.)

	S.	S.S.E.	S.E.	E.S.E.	E.	E.N.E.	N.E.	N.N.E.	N.	N.N.W.	N.W.	W.N.W.	W.	W.S.W.	S.W.	S.S.W.	Calms.
Autumn	2.8	2.8	3.9	2.7	2.7	3.2	2.2	2.4	2.0	4.1	3.6	3.8	5.0	6.5	5.2	3.2	4.3
Winter	3.1	4.4	6.0	5.1	3.6	1.5	2.2	3.1	3.3	4.1	3.7	4.5	8.0	10.1	6.9	5.1	3.0
Spring	2.3	2.3	2.3	2.4	3.7	3.8	2.1	2.7	2.7	2.4	2.9	3.8	6.5	6.5	6.0	2.9	3.6
Summer	2.4	3.3	2.5	2.2	5.4	3.9	4.0	3.7	1.4	3.4	3.7	2.2	3.4	5.2	4.3	1.8	4.0
Year	2.5	3.0	3.2	2.8	3.8	3.2	2.4	2.8	2.6	3.5	3.4	3.7	4.9	6.3	5.4	2.7	3.7

After having entered so fully into the subject of the influence of the wind's direction on the frequency of rain, it would have been highly interesting to know also something more definite on the distribution of the rainfall over the windrose; however, as there was no instrument at command, by the aid of which we should have been enabled to investigate this matter directly, and as the task of arranging the amount of rain according to the wind's direction is of too intricate a nature, without offering sufficient guarantees for the reliability of the results, we preferred computing the amount for the single points of the compass in the following manner.

Adopting the intensity of the rain in a certain month to be equal for all points of the compass, which supposition is not strictly correct, as we shall presently see, we computed by the aid of the duration table and the mean intensity for a certain month the amounts for each of sixteen points, expressing them in percents of the total rain fall for that month. The amounts thus obtained will not be far from the truth, in as much as the intensity of rain

for any month will chiefly depend on the character of the wind predominating in that month. It would certainly be preferable to have direct observations on this subject, but we are confident that in want of such the values of the subjoined table will prove to be very useful.

Amount of rain for each of sixteen points, expressed in percents of the total fall of the respective months, quarters and the year.

MONTHS.	S.	Be- tween S. and S.E.	S.E.	Be- tween S.E. and E.	E.	Be- tween E. and N.E.	N.E.	Be- tween N.E. and N.	N.	Be- tween N. and N.W.	N.W.	Be- tween N.W. and W.	W.	Be- tween W. and S.W.	S.W.	Be- tween S.W. and S.	Calms.
March	8.2	4.7	2.6	2.7	3.9	9.6	6.6	2.1	1.8	5.9	2.5	2.4	9.1	12.7	6.6	8.4	8.0
April	4.9	6.3	7.9	3.5	0.7	2.1	5.5	5.5	2.9	5.0	4.0	8.1	13.2	13.9	5.0	8.1	2.5
May	4.6	3.1	2.9	0.6	0.8	2.1	6.2	12.7	8.1	7.7	8.0	7.7	8.8	11.0	5.6	3.7	5.0
1st Quarter	5.9	4.7	4.4	2.2	1.8	4.6	6.1	6.7	4.2	6.2	4.8	6.0	10.4	12.5	5.7	6.7	5.1
June	0.8	2.5	1.5	0.0	0.0	1.5	7.6	14.3	13.4	8.8	4.3	6.1	14.2	12.5	2.7	2.6	3.0
July	1.2	1.8	6.5	3.3	2.2	0.7	5.6	8.3	11.6	9.3	4.0	5.2	14.7	11.2	5.6	3.5	4.3
August	4.9	3.0	0.4	0.2	0.1	1.6	5.9	13.1	11.5	4.2	4.5	4.6	14.1	18.2	7.8	7.0	1.5
2nd Quarter	2.3	2.4	2.8	1.1	1.0	1.2	6.3	11.9	12.1	7.4	4.2	5.3	14.3	13.9	5.3	4.3	2.9
September	4.9	4.1	1.6	1.5	1.2	2.8	3.5	6.8	9.6	4.8	6.3	5.4	16.8	15.5	9.5	3.9	1.6
October	6.7	3.5	1.2	0.6	1.1	5.1	6.2	7.5	5.5	3.1	3.4	5.0	12.2	11.4	10.8	16.0	3.6
November	4.6	3.3	5.9	3.9	4.1	5.6	5.6	6.6	3.0	5.0	2.6	4.5	11.3	11.4	9.4	9.8	2.7
3rd Quarter	5.4	3.6	2.9	2.0	2.1	4.5	5.1	6.9	6.0	4.3	4.1	4.9	13.4	12.8	9.9	9.9	2.6
December	5.4	3.5	2.9	6.3	7.3	5.4	9.5	5.2	2.2	7.2	2.9	2.9	8.5	10.1	7.4	6.9	4.5
January	8.5	12.8	3.7	1.6	2.2	4.2	6.6	6.2	2.4	2.6	4.0	2.9	3.4	11.8	11.1	8.5	5.1
February	17.6	10.8	9.0	2.3	0.9	2.8	1.8	6.0	3.1	0.5	2.0	0.4	4.8	12.9	7.3	10.8	1.6
4th Quarter	10.5	9.0	5.2	3.4	3.4	4.1	5.9	5.8	2.6	3.4	2.9	2.0	5.5	11.6	8.6	8.7	3.7
Year	5.5	4.6	3.7	2.3	2.0	3.3	6.0	8.4	7.0	5.8	4.3	5.0	11.6	12.8	7.3	7.0	3.6

For the year 1859 a similar table was derived from actual observations, the same is to be found in R. II. pag. 123. From this table and the one for duration we tried to arrive at conclusions bearing on the intensity of rain during the time the wind blows from the several points of the compass. Here are the results:

Intensity of Rain for 8 points of the Compass.

1859.	S.	S.E.	E.	N.E.	N.	N.W.	W.	S.W.
Autumn	2.8	1.4	1.8	3.7	5.2	4.8	3.5	3.4
Winter	2.7	1.2	2.6	3.3	3.3	3.5	2.6	2.4
Spring	3.9	3.3	2.7	7.8	6.3	5.2	5.0	4.8
Summer	3.5	3.2	2.8	3.7	3.2	3.7	5.2	5.5
Year	3.2	2.3	2.5	4.5	4.5	4.4	4.6	4.1

The value of these figures is quite the same as already explained, namely the amount in inches for 100 hours of rain.

An extensive catalogue, on all cases of extraordinarily heavy rainfall; has been published in R. II. pag. 124—125, and we consider now all questions in connexion with the rainfall at Melbourne as having been exhaustingly treated.

B. SPONTANEOUS EVAPORATION.

55. Observations on the amount of evaporation are by no means of a very simple nature, many circumstances exerting an influence upon the instruments used for this purpose. A great difficulty exists in placing the evaporation gauge, after having once decided on its construction, in a position which affords an opportunity to make the observations under the most normal conditions. It is all important to ensure a free action of sun and wind upon the evaporating surface, while we have at the same time to guard against interfering causes, such as spilling the water by the force of the wind and other accidental influences. These considerations are also of great weight in determining the size of the evaporating surface, as it is scarcely possible to protect the instrument sufficiently in case we increase its dimensions beyond certain limits. The evaporation gauge, adopted at the Flagstaff Observatory after mature consideration is certainly not above all objections, which may be advanced against its construction and mounting, but considering the peculiar circumstances under which it had to be erected it seems to offer fair guarantees for reliable results. A full description of this instrument and the method of observing with the same has been given R. II. pag. 125 and 126, together with some of the principal conclusions already arrived at.

The daily abstracts in R. II. and appendix 1 and 2 of this volume contain valuable materials for the study of this matter, and we propose giving in the present a few facts only bearing on spontaneous evaporation in juxtaposition with some other elements exerting more or less influence upon it. We do not pretend, however, to exhaust the subject by what we are prepared to offer.

1859—63.	Mean monthly evaporation.	Mean daily amount of		Mean temperature of surface.	Mean relative humidity.	Mean force of wind.
		evaporation.	rain.			
	inch.	inch.	inch.	°	(0—1)	(0—12)
March . . .	4·6223	0·154	0·040	66·69	0·6673	1·63
April . . .	2·3930	·079	·075	59·27	·7301	1·79
May . . .	2·1277	·071	·066	52·28	·7670	2·12
June . . .	1·4987	·050	·078	48·80	·8215	1·92
July . . .	1·2807	·043	·058	47·58	·8234	2·02
August . . .	1·7902	·060	·045	50·52	·7684	2·04
September . .	2·8980	·096	·079	54·77	·7253	2·24
October . . .	4·2770	·143	·081	60·13	·7034	2·04
November . .	5·2144	·173	·060	64·70	·6529	2·12
December . .	6·2500	·208	·109	68·25	·6480	2·13
January . . .	7·0490	·235	·068	70·36	·6384	2·28
February . .	5·6277	·188	·063	68·68	·6731	1·95

We glean from the above, that the mean annual amount of evaporation is equal to 45·0287 inches. For further information we refer to appendix 3 and 4.

In order to form an idea on the effect of the wind from various directions, we need but to study the windroses for pressure of vapor, temperature of air and force of wind. So we see

for instance that Northerly winds combine in their character, chiefly during summer, all qualities to cause them to be the principal evaporators, and daily amounts of evaporation of 0.400 are nothing uncommon while they prevail.

C. DEW.

56. The tables Nr. 3 and 4 in the appendix to this volume give in some of their columns a clear idea on the distribution of dew throughout the year. We perceive from Nr. 4 that the mean monthly number of hours reaches a maximum value in June, the average for five years amounting in this month to 95.9 hours. The minimum of 21.9 hours takes place in February. Very striking is the change which manifests itself in April and October, and we recognize in this, indeed as in nearly every other element, the division of the year in two large periods, which are identical or nearly so with the two periods, marked by the shifting of the wind's mean direction from North to South and back. By the aid of the penthemeral mean number of hours of dew (Table 3) it would scarcely be difficult to trace this change even to within five days.

It was for some time even the practice at the observatory to collect and weigh the amount of dew. In effecting this we were less guided by the view of collecting the greatest possible amount than by the desire to collect it under such conditions which allow of the greatest uniformity of the mode of effecting the formation and measuring the amount of dew. Consequently two panes of plate glass, 12 by 8", were alternately exposed in a horizontal position and at an open place. In order to ensure uniformity of surface and color, they were perfectly smooth and rested on pieces of board painted quite black. The panes being perforated in their centre, a piece of strong wire was fixed to them, by the aid of which they could be suspended to a balance, for the purpose of being weighed and the amount of dew deposited being determined. The number of observations collected in this way being too small to allow of a discussion, we abstain from adding any of the results here, but as these measurements appear in the original meteorological diary we considered it proper to take this opportunity to explain the mode of observation, in case someone should on a future occasion deem it desirable to turn them to account.

To examine into the influence of the wind on the formation of dew a classification of the observations on the duration according to the wind's direction was carried out.

Mean Number of Hours of Dew for the several points of the Compass.

MONTHS 1858—63.	S.	S.S.E.	S.E.	E.S.E.	E.	E.N.E.	N.E.	N.N.E.	N.	N.N.W.	N.W.	W.N.W.	W.	W.S.W.	S.W.	S.S.W.	Total for the period.
	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.
March . . .	1.00	3.17	2.50	3.17	1.33	5.00	10.17	4.83	0.83	3.33	4.67	2.83	4.27	1.67	0.0	0.0	59.4
April . . .	0.83	1.53	2.17	3.50	0.67	6.50	33.03	14.83	5.67	4.43	7.17	3.50	2.47	0.33	0.67	0.33	77.5
May . . .	0.33	1.83	1.33	1.00	0.67	4.00	13.93	8.00	1.77	3.60	2.33	4.33	2.17	2.37	0.0	0.83	56.9
June . . .	1.83	3.50	1.17	1.67	2.73	9.17	21.33	9.47	3.60	5.17	6.50	3.00	0.33	0.0	0.83	0.50	95.9
July . . .	1.67	1.83	3.70	2.67	3.17	4.83	23.33	8.40	2.83	3.17	3.17	2.33	0.67	0.0	1.83	1.83	72.8
August . . .	1.67	2.00	2.00	3.00	2.00	6.17	17.17	16.60	7.20	2.67	2.67	2.00	1.00	0.0	1.33	2.33	63.5
September . .	1.00	1.00	0.67	1.17	3.17	8.37	29.23	8.33	2.67	4.83	3.33	1.73	1.85	0.33	0.0	0.33	65.2
October . . .	4.83	5.90	4.83	4.67	3.60	5.50	8.83	6.33	1.00	4.00	4.83	2.00	1.67	1.50	0.0	2.30	68.2
November . .	2.00	1.17	0.67	3.17	6.50	2.00	5.83	4.50	1.33	1.67	3.93	1.33	1.50	1.50	0.0	0.00	41.8
December . .	0.83	1.67	2.83	2.83	1.00	5.00	5.50	2.67	1.00	3.00	1.67	3.37	4.00	1.33	1.17	0.33	45.4
January . . .	0.50	5.00	2.53	0.50	1.67	0.83	3.60	1.33	1.17	1.67	1.33	0.83	1.33	0.0	0.0	1.17	24.9
February . .	0.0	1.67	1.67	3.17	1.00	0.67	2.00	1.33	1.00	2.50	3.00	2.00	1.33	0.33	0.0	0.0	21.9
Year . . .	16.50	30.27	26.07	30.50	27.50	58.04	173.95	86.62	30.07	40.04	44.60	29.25	22.59	9.36	5.83	9.95	693.4

The last column of the above table shows the total number of hours, inclusive of cases of dew occurring during calms, and therefore affords an opportunity for ascertaining the duration of dew when there was no draught of air perceptible. Thus we arrive at the conclusion that out of the total number for the year 52·3 hours of dew, or about 7·5% occurred during dead calms. We further notice that in every season of the year N.E. wind is most favorable for the formation of dew, while S.W. wind seems to be least so.

D. FOG.

57. To facilitate the study of this topic we shall have to refer again to appendix Nr. 3 and 4, and to R. I, 73 and R. II, 127. In addition to the evidence adduced in those passages of our previous publications we subjoin here a classification of the observations on the duration of fog according to the wind's direction.

Mean Number of Hours of Fog for the several points of the Compass.

MONTHS 1858—63.	S.	S.S.E.	S.E.	E.S.E.	E.	E.N.E.	N.E.	N.N.E.	N.	N.N.W.	N.W.	W.N.W.	W.	W.S.W.	S.W.	S.S.W.	Total for the period.
	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.
March	0·0	0·0	0·0	0·0	0·33	0·50	0·67	0·33	0·0	0·0	0·03	0·0	0·0	0·0	0·0	0·0	2·2
April	0·0	0·33	0·33	0·0	0·0	0·0	2·57	0·70	0·17	0·67	0·0	0·0	0·0	0·0	0·0	1·00	7·0
May	0·0	0·0	0·33	0·0	0·0	0·07	0·67	0·0	0·0	0·33	0·0	0·33	0·0	0·0	0·0	0·0	8·3
June	0·0	0·17	0·0	0·0	1·17	2·00	7·43	2·30	0·53	0·50	0·67	0·33	0·17	0·33	0·50	0·57	36·9
July	1·33	0·10	5·80	0·33	1·67	3·50	5·70	4·67	0·33	1·33	0·67	0·80	0·0	0·90	0·0	0·0	37·8
August . . .	0·0	0·0	0·0	0·33	0·17	0·17	9·00	3·17	0·67	0·33	1·67	0·0	0·33	0·0	0·33	1·17	17·0
September . .	0·0	0·0	0·0	0·0	0·0	1·20	0·0	0·0	0·0	0·17	0·0	0·0	0·0	0·0	0·0	0·0	5·3
October . . .	0·0	0·33	0·0	0·17	0·0	0·0	0·30	0·50	0·0	0·0	0·0	0·60	0·0	0·0	0·0	0·0	3·0
November . .	0·0	0·0	0·23	0·0	0·0	0·0	0·67	0·0	0·0	0·0	0·0	1·00	0·33	0·0	0·0	1·33	1·5
December . .	0·0	0·0	0·0	0·0	0·0	0·33	0·0	0·0	0·0	0·33	0·0	0·0	0·0	0·0	0·0	0·0	0·6
January . . .	0·0	0·50	0·0	1·50	0·33	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·4
February . .	0·0	0·0	0·0	0·0	0·0	0·50	0·53	0·83	0·0	0·33	0·67	0·50	0·33	0·0	0·0	0·0	4·7
Year	1·33	1·43	6·70	2·33	3·67	8·27	27·54	12·50	1·70	4·00	3·70	3·57	1·17	1·23	0·83	4·07	124·7

With regard to the last column the same is to be remarked as in the last paragraph. In this case the number of hours of fog during calm weather amounts to 40·7 or 36·5% of the yearly total number. The winds from N.E. and S.W. are again indicated as involving the extremes in the occurrence of fog.

The daily meteorological abstracts contain a great deal of matter of the highest importance for the thorough investigation of all phenomena connected with aqueous meteors, and we may therefore be allowed to refer those more especially interested to these elaborate publications.

X. ON AQUEOUS VAPOR AND TERRESTRIAL RADIATION.

58. The important investigations of Professor Tyndall F. R. S. on a property of aqueous vapor, hitherto unknown, added another factor to climatological and metereological science which henceforth cannot be left out of consideration in searching for the principal causes of meteorological phenomena in general, and in explaining the leading features of a climate in specie. Indeed, many appearances in nature have, up to a very recent period, been explained in a manner perfectly inadequate to the state of science, mostly for want of a better, more philosophical reason, which seems now to be found in the fact "that the vapour which absorbs heat thus greedily, radiates it copiously" (Tyndall, Heat as a mode of motion pag. 387). Those especially interested in this matter, we must refer for examples to the work just quoted, proving the correctness of the above assertion; suffice it for the present to mention, in addition to the instances there given, another more immediately relating to the climate which forms the subject of this work, viz: the comparatively low temperatures, we have generally to record at Melbourne, on the approach of Northern winds which are characterized by a low degree of relative humidity of air. During the hours of night, when the sun does not influence the thermometer and hot puffs from the North raise but occasionally the temperature, the dryness of the air, already perceptible to the hygrometer, manifests itself by an increased radiation, and consequent thereon we feel the air chilly. This effect ceases at the appearance of the sun and after the "hot wind" has set in with all force which, on an average, takes place towards 8^h or 9^h in the morning. A study of the thermic windrose corroborates these remarks, for it is scarcely possible to account for the variation in the depression in temperature for directions of the wind between E and NNE in a satisfactory and exhausting manner, without due reference being taken to the effects of radiation, varying according to the degree of humidity within the NE quadrant. It is evident that the effect of the wind on temperature of air, assigned in paragraph 20 page 50 to the peculiarity of the position of Melbourne with respect to the great Mountain chain, can but partly account for the phenomenon alluded to by the coincidence of the main axis of that mountain chain and the point ENE; whilst the combined action of the great plains between the Lachlan, Darling and Murray towards NNE and NE, and the Australian Alps to the ENE of Melbourne, both influencing the degree of humidity of air in alike manner, are sufficient to explain, in conjunction with the direction of the wind, prevailing at a certain hour of the night, the variation of the point of lowest temperature noticable throughout the whole year. Whenever the wind in its daily rotation arrives in the North and NW, the day is so far advanced as to obliterate so delicate differences in temperatures, as those we have just spoken of, and the thermic windrose advances then rapidly towards its Maximum.

59. A careful observation of the radiation thermometer could not fail to impress me with the certainty, that not only the degree of clearness of the sky exerted an influence upon its variations, as at times when the blue of the sky exhibited not the least change, great differences in the degree of radiation were observable. Convinced that there are still other causes to influence terrestrial radiation, I resolved to institute a rigorous inquiry with a view to detect

these causes by actual observations, and at the beginning of March 1861 a radiation thermometer was put up in such a manner, as to admit of its being read at any time of day and night. By the time, when systematic registration was discontinued at the Observatory, 4376 single observations on terrestrial radiation had been collected, and it was only then that I became acquainted with the results of Professor Tyndall's experiments on the connexion between radiation and aqueous vapor. The passage of his work, already referred to, which struck me most forcibly as bearing directly on the question, I had proposed to myself, may be inserted hereafter. He says on page 390 "In Australia, also, the diurnal range of temperature is very great, amounting, commonly, to between 40 and 50 degrees. In short, it may be safely predicted, that wherever the air is dry, the daily thermometric range will be great. This, however, is quite different from saying that when the air is clear the thermometric range will be great. Great clearness to light is perfectly compatible with great opacity to heat; the atmosphere may be charged with aqueous vapour while a deep blue sky is overhead, and on such occasions the terrestrial radiation would, notwithstanding the 'clearness', be intercepted".

The records of the Observatory, containing as they do simultaneous readings of the hygrometer and the radiation thermometer, offered a means of proving this important function of aqueous vapor in our air directly, provided the instrument in use was delicate enough for this purpose. A classification and discussion of these observations was therefore most desirable, but a task not so easily accomplished, and it was not until the 4th of May 1866 when I was in a position to communicate to Professor Tyndall the results of my inquiry, fully bearing out the conclusions this distinguished savan had previously arrived at by the experiments he had made in the laboratory.

Professor Tyndall wrote me on the 10th of May a letter, acknowledging the receipt of my communication, from which I may glean the following passage: "I regard your letter of extreme importance. As regards the science of meteorology I think it is hardly possible to overrate the value of your results. . . . Thinking that you would not object to the publication of your letter I have sent it to the editor of the Philosophical Magazine".

Consequently my letter appeared with a short introduction by Professor Tyndall in that Journal for June (Supplement 1866, from which the following was reprinted with but slight alterations.

To the Editors of the Philosophical Magazine and Journal.

Gentlemen,

I Transmit to you a communication from M. Neumayer, which I trust will have the effect of stimulating other meteorologists to enter upon and pursue the line of inquiry which he has so ably and zealously begun. There is, in my estimation, no result of physical science more certain than that the aqueous vapour of our air exerts a powerful influence upon the radiation from our earth; and there is none, I imagine, more likely to guide the really scientific meteorologist to results of permanent value.

John Tyndall.

To Professor Tyndall, F. R. S. &

Frankenthal, Pfalz a. Rhein, May 4, 1866.

My Dear Sir

You will perhaps remember that some two years ago I sent you some original observations made at the Flagstaff Observatory, Melbourne, bearing on the absorption of heat by aqueous

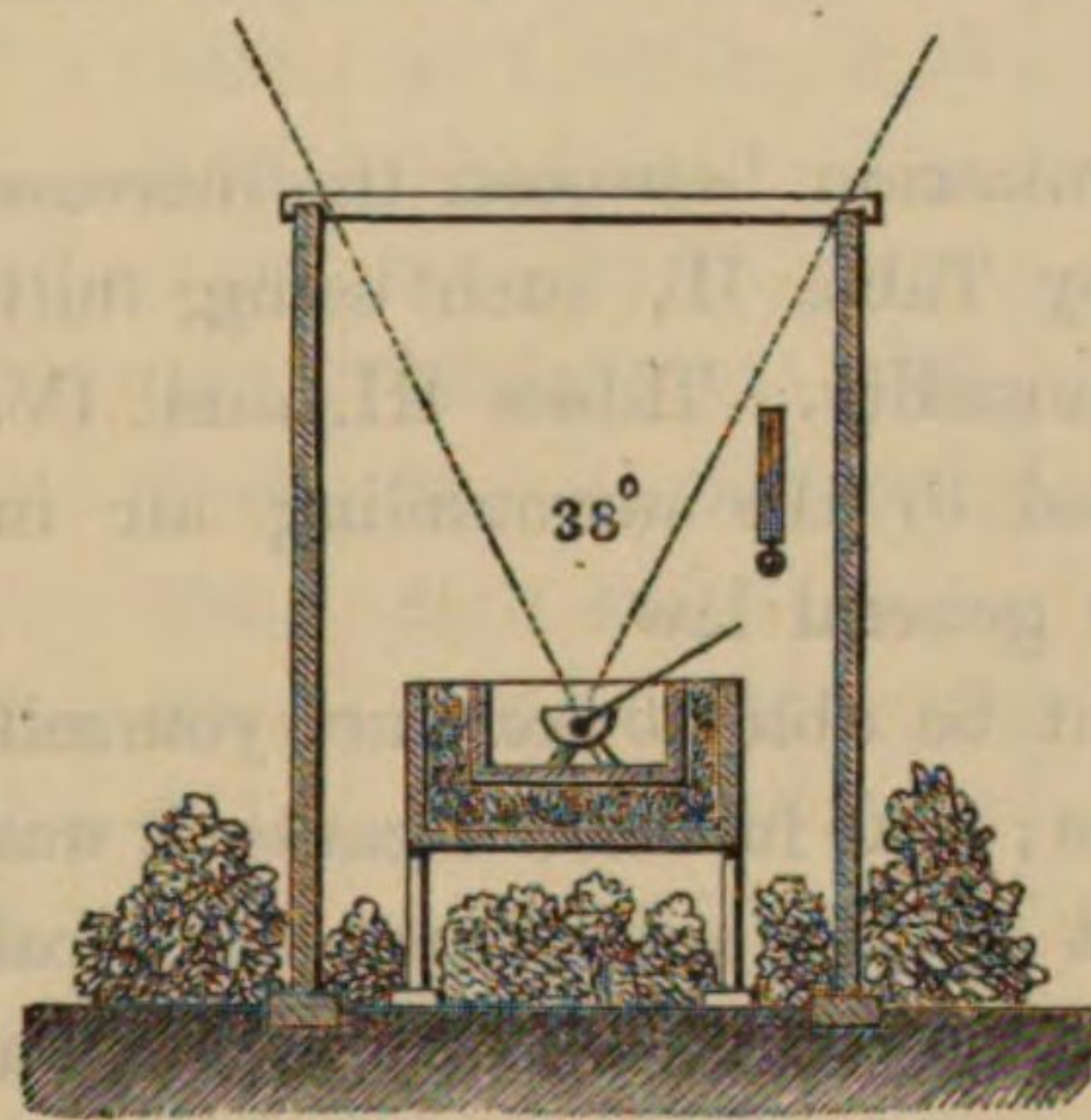
vapor and its relation to terrestrial radiation. At the time when I did myself the pleasure to call upon you at London, you stated that great pressure of other matters did not admit of your undertaking the task of discussing those observations; and in consequence of this I had the extensive labour of classifying and condensing so large a number of figures done in my bureau of computation, established with the object of publishing discussions on the magnetic and meteorological observations made by me during the years 1858—63. In the annexed Tables, four in number, you receive the results of my labours in this direction, which I feel great pleasure in putting before you.

In order that you may be able to form an opinion as to the manner in which the observations were made, I subjoin the following remarks.

1) The observations were made at all times of the day and the night whenever the sky was clear, i. e. the zenith perfectly free from clouds.

2) The tension of aqueous vapor and the degree of relative humidity were observed by August's psychrometer, continually checked, however, by Döbereiner-Regnault's aspirator-hygrometer. The reductions were effected by Regnault's Tables, the thermometers being Kew standards.

3) The radiation-instrument consisted of a spirit minimum-thermometer of Kew, the bulb of which was placed and carefully adjusted in the focus of a parabolic reflector, nicely polished and silvered, 6.4 inches wide and 2.4 inches deep*. This reflector was put in a box filled with cotton and placed in a little house, keeping out the rays of the sun, but in such a manner that the zenith over the instrument remained perfectly free for a space of some 38° . The focus of the reflector was about $1\frac{1}{2}$ feet above the surrounding ground (see introduction to 'Results', page 4).



4) The psychrometer was placed close to this radiation-apparatus; and in order to have a control, a thermometer was placed within the little house (see annexed figure), the same being frequently compared with the Kew standard.

5) Table I. contains in its first column the number of single simultaneous observations, the second column shows the mean pressure of aqueous vapour, the next the mean temperature of the air, then the mean temperature indicated by the radiation-instrument and the last the mean difference between temperature of air and radiation, obtained by the instruments described. The results have been arranged according to the value of the aqueous tension.

6) Table II. shows the relation between the degree of relative humidity of air and the radiation-difference. For every single set of observations the relative humidity was computed.

7) It remains yet to be mentioned that the elaborate task of classifying and reducing the 4376 single sets of observations has been twice executed, both computations being quite independent of each other.

8) With a view to show that the decrease in radiation with an increase in humidity, as evident from Table II., is not due to the decrease in temperature, as may be suspected when glancing over Table II., two more Tables were constructed illustrative of the influence

* In strict conformity with the instructions of the Royal Society.

the temperature of the air alone exerts on the radiation-instrument (Tables III. and IV.). For, although fully aware of the principles generally adopted with regard to the influence of the temperature of the air on radiation, and also of the results of your investigations (§ XII pag. 406), to the effect that the temperature of the surrounding air does not sensibly influence the difference of temperature between the radiating body and the temperature of the air, I thought one might be inclined to suspect undue radiation influencing the reading of the parabolic thermometer, and I took for this reason the trouble of classifying the observations merely according to temperature of the air.

The results at which I arrive may be summed up in the following lines: —

a) The absolute quantity of aqueous vapor in the air is in itself alone not sufficient as a criterion for the degree of radiation; or if it should be otherwise, the instrument used for the observations is not sufficiently delicate to show the degree of influence.

b) The absolute quantity of aqueous vapor, together with a certain temperature, i. e. the relative humidity of air, greatly influence terrestrial radiation, in such a manner that, the greater the degree of relative humidity, the less radiation is noticeable (see Table II.). With respect to the latter remark, I cannot refrain from adding a few words. The law is even noticeable, though less distinctly expressed, in the lower per cents of humidity in extreme cases of dryness, although in all these cases a thin veil of cirrostratus clouds covers the sky, so delicate as frequently not to be perceptible by the eye. It is further to be remarked that, during hot winds, when the air is extremely dry, quantities of dust are floating in the air, seriously interfering with radiation, although the sky is apparently quite clear. All these cases have been included in deriving the above results; and considering all, we must be surprised that, notwithstanding all this, an increase of radiation for degrees of humidity between 15 and 30 per cents is perceptible*.

It is scarcely necessary for me to dwell on the apparent connexion between the increase of temperature of the air and the amount of radiation shown by Table II, such being fully accounted for by the relation between temperature and relative humidity. Tables III. and IV. sufficiently prove that the radiation instrument was not influenced by the surrounding air in any undue manner so as to interfere with the recognition of the general law.

I hastened to put these facts before you, in order you might be able to convince yourself of the reliability of the observations and the method of discussion; and further, because I was convinced you would find it important to receive proofs that by the aid of meteorological instruments, generally in use, we are able to recognize a function of aqueous vapor in our atmosphere, which hitherto had only been demonstrated by your own important experiments (as far as my knowledge on this point goes).

You would oblige me exceedingly by giving me your ideas on the various points raised in this letter. According to your opinion, I purpose either turning the results to account by publishing them in my next publication, or hand them over to you with no other condition but that I shall be supplied with whatever you shall write upon this special subject.

Requesting you kindly to excuse the liberty I have taken in thus troubling you,

I remain my dear Sir,

Yours very truly

G. Neumayer.

* I have shown that the smoke of the London air is feeble in comparison with its aqueous vapour. — J. T.

I. RESULTS OF SIMULTANEOUS OBSERVATIONS ON TENSION OF VAPOR, TEMPERATURE OF AIR AND TERRESTRIAL RADIATION.

(4254 single observations.)

Number of observ.	M E A N				Number of Observ.	M E A N				Number of Observ.	M E A N			
	Pressure of Vapor.	Temp. of air.	Temp. of rad.	Temp. of air minus Tmp. rad.		Pressure of Vapor.	Temp. of air.	Temp. of rad.	Temp. of air minus Tmp. rad.		Pressure of Vapor.	Temp. of air.	Temp. of rad.	Temp. of air minus Tmp. rad.
	inch.	°	°	°		inch.	°	°	°		inch.	°	°	°
4	0.1712	32.1	30.75	1.35	29	0.2703	55.1	51.54	3.56	45	0.3483	64.8	60.77	4.03
43	.1929	37.7	34.97	2.73	44	.2704	50.1	46.28	3.82	44	.3485	56.3	52.93	3.37
10	.1956	46.9	43.52	3.38	44	.2869	54.7	50.96	3.74	48	.3493	65.0	61.83	3.17
42	.2100	39.9	37.28	2.62	41	.2878	56.4	52.67	3.73	45	.3497	66.9	62.97	3.93
34	.2114	45.3	42.42	2.88	43	.2879	54.0	49.69	4.31	49	.3677	58.7	55.46	3.24
43	.2120	46.4	43.52	2.88	41	.2884	56.8	52.80	4.00	45	.3680	70.2	66.65	3.55
44	.2133	49.5	45.98	3.52	43	.2886	52.7	49.31	3.39	44	.3687	64.5	60.78	3.72
45	.2293	43.2	40.22	2.98	43	.2888	52.5	48.65	3.85	48	.3687	63.4	60.17	3.23
40	.2302	43.6	40.26	3.34	45	.2892	59.6	56.04	3.56	24	.3692	63.0	59.31	3.69
40	.2304	46.2	43.10	3.10	40	.2894	57.2	53.20	4.00	44	.3692	64.4	60.06	4.34
43	.2307	45.4	42.17	3.23	45	.2899	50.7	47.57	3.13	43	.3701	60.5	56.98	3.52
43	.2307	51.3	46.70	4.60	40	.2900	56.5	52.59	3.91	44	.3876	66.3	61.80	4.50
44	.2313	52.9	50.21	2.69	49	.2915	53.3	49.33	3.97	49	.3888	61.8	58.20	3.60
29	.2322	52.6	49.09	3.51	45	.2940	61.9	58.20	3.70	43	.3894	63.2	59.44	3.76
44	.2484	47.3	43.93	3.37	44	.3076	53.0	49.79	3.21	45	.3900	69.2	65.43	3.77
44	.2493	46.5	43.69	2.81	40	.3080	61.1	56.52	4.58	19	.3909	59.0	55.68	3.32
43	.2494	47.1	43.78	3.32	40	.3088	57.5	54.12	3.38	44	.4081	65.9	62.06	3.84
41	.2496	52.6	49.19	3.41	43	.3091	57.6	53.65	3.95	49	.4087	63.5	59.90	3.60
44	.2497	48.2	45.88	2.32	43	.3093	58.1	54.00	4.10	43	.4092	62.3	58.30	4.00
43	.2497	49.4	45.80	3.60	44	.3095	54.2	50.37	3.83	3	.4100	64.4	61.33	3.07
43	.2502	54.9	51.30	3.60	24	.3095	55.9	51.72	4.18	48	.4280	68.1	63.86	4.24
45	.2504	46.3	41.78	4.52	44	.3096	55.0	51.05	3.95	9	.4290	64.0	60.71	3.29
40	.2510	59.8	55.68	4.12	45	.3097	64.4	60.93	3.47	49	.4295	67.1	62.97	4.13
40	.2512	48.2	45.11	3.09	44	.3111	57.7	53.88	3.82	32	.4360	67.5	63.94	3.56
6	.2533	54.9	51.80	3.10	4	.3232	55.1	51.80	3.30	35	.4476	66.7	62.93	3.77
41	.2523	52.1	48.57	3.53	44	.3280	57.7	53.67	4.03	48	.4497	69.2	64.95	4.25
43	.2683	48.5	44.99	3.51	48	.3286	55.5	51.68	3.82	48	.4692	70.6	66.94	3.66
45	.2687	52.7	48.99	3.71	43	.3287	59.1	55.30	3.80	26	.4698	71.7	67.86	3.84
44	.2687	50.2	46.60	3.60	41	.3290	59.4	55.50	3.90	3	.4886	68.7	65.84	2.86
40	.2688	56.3	52.25	4.05	44	.3291	55.2	51.30	3.90	48	.4893	73.6	70.56	3.04
44	.2689	50.2	46.62	3.58	45	.3294	59.3	55.66	3.64	48	.5096	73.1	69.63	3.47
41	.2691	56.4	52.66	3.74	40	.3298	66.7	62.37	4.33	27	.5284	76.8	73.22	3.58
44	.2692	47.7	44.12	3.58	40	.3320	68.8	65.12	3.68	12	.5460	77.0	72.45	4.55
43	.2694	50.3	46.32	3.98	43	.3468	62.1	58.25	3.85	12	.5715	79.4	75.90	3.50
43	.2695	51.8	49.25	2.55	49	.3472	56.3	52.82	3.48	19	.5908	77.9	74.18	3.72
40	.2696	64.8	60.70	4.10	44	.3478	60.00	55.77	4.23	13	.6061	72.5	69.92	2.58
43	.2699	53.2	49.66	3.54	34	.3481	61.00	56.59	4.41	4	.6292	78.3	76.07	2.23

TABLE II.

Groups	Relative humidity.	Number of observat.	Temperat. of air.	Temperat. of radiat.	Temper. of air minus radiat.
	per cent.		°	°	°
1	22.417	190	84.83	80.04	4.79
2	40.220	406	71.43	66.74	4.69
3	47.479	244	68.03	63.60	4.43
4	52.455	286	66.46	62.09	4.37
5	57.521	322	61.99	58.07	3.92
6	62.580	301	59.70	56.00	3.70
7	67.441	322	58.01	54.30	3.71
8	72.485	357	55.12	51.60	3.52
9	77.427	438	52.67	49.19	3.48
10	82.598	458	51.43	48.07	3.36
11	87.397	426	49.63	46.42	3.21
12	92.348	403	46.26	43.15	3.11
13	96.643	223	43.33	40.78	2.55

TABLE III*.

Number of		Mean press. of vapor.	Mean temp. of air.	Temperat. of radiat.	Temper. of air minus radiat.
Groups	Observat.				
		inch.	°	°	°
220	7	0.2009	42.54	39.77	2.77
284	7	.2307	47.89	44.54	3.35
259	6	.2493	48.52	45.38	3.14
215	6	.2514	52.70	49.13	3.57
257	6	.2687	52.38	48.68	3.70
213	7	.2698	53.30	49.71	3.59
385	9	.2885	54.95	51.21	3.74
258	6	.3000	57.22	53.43	3.79
243	6	.3000	57.53	53.62	3.91
268	7	.3253	57.10	53.46	3.64
295	7	.3401	62.03	58.08	3.95
276	6	.3552	63.65	60.10	3.55
296	7	.3746	63.40	59.60	3.80
384	11	.4117	64.93	61.24	3.69
343	13	.5229	73.50	70.04	3.46

TABLE IV.

Number of Observations	Temperat. of air.	Temperat. of radiat.	Pressure of Vapor.	Temper. of air minus radiat.
	°	°	inch.	°
251	41.46	38.50	0.2108	2.96
747	48.30	44.91	.2502	3.39
881	53.70	50.12	.2799	3.58
919	58.01	54.28	.3163	3.73
740	63.40	59.64	.3628	3.76
522	68.15	64.29	.4081	3.86
135	72.72	69.49	.5187	3.23
74	77.88	73.26	.5732	3.52

* In this Table are represented the means of the groups, irrespective of the number of single observations.

I need scarcely mention that the values arrived at only possess a relative worth with respect to the instrument used. An apparatus measuring terrestrial radiation absolutely and in a manner which renders it practical, is, I think, yet to be contrived.

60. An examination of the various phenomena, forming the basis of the Climate of the SE. portion of the Australian continent, with a special view to introduce the powerful element which is the subject of these lines, would be a matter of the greatest importance, but cannot possibly fall within the scope of this work, because such a task, I venture to say, will have to be preceded, when once undertaken, by a partial revision of our theoretical views on many of the leading meteorological principles. But I believe that I was successful in showing that henceforth meteorologists cannot, in drawing their conclusions, neglect an agent, exerting such a decided influence on the temperature of our atmosphere.

XI. METEORS.

61. In both volumes, already issued by the Flagstaff Observatory, some of the results bearing on the occurrence of meteors in the Southern hemisphere have been delineated, but they had to be considered as being preliminary, the main discussion of the whole number of observations on this topic being intended to follow in the third volume. Those publications had

partly the object to give an idea of the extent of my labours in this direction, and of the time devoted to meteor-observations; partly they were destined to facilitate a future complete discussion; and lastly, it was thought desirable to inform scientific men, interested in this special branch of astronomy, as early circumstances would admit, in order to direct their attention to certain primary determinations, calculated to guide them in similar researches in the Southern hemisphere. The first volume contains in chapter XI. (pag. 84 — 97) a copy of the original register of meteors, as it was kept during five years at the Observatory, whilst in chapter VII. of the second volume (pag. 137—142) some of the results of the discussion on these observations have been given. With respect to the latter, it may not be out of place here to call to mind that they were derived from only 1428 single meteors, as far as regards the annual and diurnal variation in the frequency of meteors, and that only 547 single notations had been employed for the determination of the radiant points, points of divergence or radiation. It was therefore certain that the subsequent discussion, the result of which I am about to subjoin, would materially amend the conclusions originally arrived at. If we remember, what a number of years of continuous observations have been required, to determine for the Northern hemisphere some of the fundamental truths without which an inquiry into the nature of such transient bodies, as shooting stars certainly are, cannot possibly be crowned with success; and if we further take into consideration that but very few fellow labourers were able to assist one another in localities south of the equator and to combine their exertions to a system, as has been done in Europe and America, we cannot help feeling surprised that so much has already been achieved also in this field of research. For, scanty as our observations on meteors and the conclusions based thereon may appear, when compared with the results of similar exertions in the Northern hemisphere, they will form the basis for future inquiry in a branch of physical science of the highest importance for a complete knowledge of our planetary system; and they will, I sincerely trust, stimulate others to pursue a path which has been first struck out in a systematic manner of observation by the staff of the Flagstaff Observatory.

Soon after my arrival in Europe, I endeavoured to secure to such an elaborate task, as the discussion of upwards of 2000 observations on meteors undoubtedly is, the assistance of one of the few authorities on investigations of this kind, and I was fortunate enough to meet with the greatest courtesy and readiness on the part of *Professor Dr. E. Heis*, of Münster, who is justly placed among those standing foremost in the ranks of philosophers making this special branch of science the study of their lives. Professor Heis, guided by no other interest but that of science, kindly undertook the discussion of the observations made at Melbourne, and, I am sure that all will concur in this verdict, has acquitted himself of this task in an admirable manner. What gives this treatise a special worth, is the reference in it to the few other observations hitherto made in the Southern hemisphere, by this corroborative evidence affording a means of forming an opinion on the Melbourne observations. In justice to the few, however, who have devoted zeal and time to similar studies, and of whose observations I have only received cognisance after the materials had been placed in the hands of Prof. Heis, I purpose to add a few remarks, gleaned from the meteorological reports of *Mr. F. Abbott*, F. R. A. S., of *Hobarton*, a gentleman well known for the valuable assistance he has rendered to astronomical and physical science by the labours of his private observatory. It further devolves upon me to make mention of the kind manner in which *Mr. Jonathan Bolton* took upon himself to watch the sky for shooting stars, after the discontinuance of the systematic work of the Observatory.

Frequent allusions will occur to his observations, which were made on board the hulk "Sacramento," then at anchor in Hobson's Bay.

62. It is undoubtedly a matter of some interest to become acquainted with the manner in which the observations, forming the basis of the subjoined discussions, have been effected; and in conclusion I may also be permitted to throw out some suggestions on the mode in which I think observations on meteors will have to be undertaken for the future, in order to insure reliability and uniformity in the results. It is true, frequent opportunities of observing single meteors compensates to a certain extent the inaccuracy hitherto connected with observations of this kind, at least in so far as such of these bodies are concerned as belong to one and the same system of divergence; but it is nevertheless also true that, even in observing single meteors, a far higher degree of certainty in determining their apparent courses will be requisite, than it hitherto has been deemed necessary to strive after. For the latest discoveries in this direction, proving the close relationship between comets and meteors, call upon those, entrusted with the cultivation of astronomical science, to bring both skill and energy to bear upon the advancement of its youngest branch.

The mode of observing, which has been in practice at the Flagstaff Observatory, may best be learnt by an inspection of the register of meteors already referred to and contained in "R. I., pag. 84—97." Nothing remains to be added to the information which may be gleaned from those pages, but that on all occasions, offering the least chance for an observation, a sharp look-out was kept for shooting stars. As already explained (R. II., pag. 138) there was usually but one observer employed at a time, who had to direct his attention alternately to various parts of the sky; the region near the ecliptic was particularly watched. Inasmuch as all the observers, engaged at different times, were not equally familiar with the constellations and the names of the single stars, it was made an invariable rule to estimate azimuth and altitude of the extremities of the apparent courses of meteors; at the same time, however, good star charts, ready at command, enabled observers to refer the same to well-determined stars, thus affording a mutual check on the modes of registration. Towards the end of the period over which the observations extend, occasional use was made of an instrument, devised by myself, and called the "*Meteorograph*." I shall now endeavour to give in a short outline the leading ideas guiding me in its construction, as also the mode of observing with the same.

63. Long experience in registering observations on meteors and the zodiacallight has taught me that there exists a great difficulty in preserving the sensibility of the eye during the continuance of the observations. A glance at the star charts or at some paper, intended to receive the notations, or the effect of candle light, will prevent the eyes for some time after from perceiving the delicate impressions, peculiar to some of those eminently slight phosphorlike meteoric lines, or the limits of the zodiacallight, not to speak of the impossibility of getting the right ideas of the colours connected with some of these phenomena, if the eyes are not carefully protected against any undue influence of light. It is moreover scarcely necessary to point out, how easily a mistake may occur in transferring an observation made in the sky to star-maps or any of the other means of record hitherto in use; and it is evident that frequently most valuable observations must have been lost, simply because the observer was obliged to discontinue watching for the purpose of recording his notations. In short, the means of observations on meteors, up to the present time considered to be sufficient and adequate to the purpose, because little value was attached to observations on these transient bodies, will have to be improved. The

importance which henceforth necessarily must be attached to researches, calculated to throw light upon the nature of meteors, will fully justify my exertions in this direction.

After these introductory remarks, it is evident that, in solving the problem I had proposed to myself, the following leading points were to be attended to: 1) Greater accuracy than hitherto employed in observations on meteors; 2) a mode of registration which admits of the observer remaining uninterruptedly in the open air and the dark; 3) simple and easy management, in order that no particularly great skill need be required, and the observation may be readily and exactly effected by one observer. How far these conditions have been realized with regard to the instrument about to be described, we shall see presently.

The meteorograph* is constructed and mounted on the equatorial principle. Plate 17^b (22) gives every particular of construction. In Figs. 1 and 2 a b is the Polar, and c d the Declination axis; w and w' are rollers covered with paper, the one (w) for receiving registrations of rightascension and the other (w') for declination. At the one end of each cylinder or roller is a graduated circle, the one representing the hour-, the other the declination-circle. The lower extremity of the polar axis rests on the top-plate m n of the stand, by the medium of the hinge x, being fixed in its position parallel to the earth's axis by means of the support l k y i e. By the screws the axis is kept in the bearings of the brass arm i e. There is a hinge in y which admits of the brass arm i e being adjusted perpendicularly to the axis, in case it is moved up or down by the screws in k and i. It is evident that, by using two adjusting screws (k and i), as in our instrument, the angular motion of the axis becomes considerably enlarged, thereby making the instrument capable of being used in latitudes of 30° to 47°, its middle position being 38° 30'. The pivots of the declination axis rest in bearings from in the brass frame z z, to which it is fixed by the clamping screws β, β (Fig. 3). A principal part of the instrument consists of the apparatus for noting the observations on the paper of the rollers; and as both that for the declination and that for the rightascension roller are identical, with but very slight differences, the same description will answer for both. The corresponding parts of the declination apparatus are distinguished by attaching a dash to the letter used in the description of the hour apparatus. s u is a long and nicely cut screw, moving in the brass windings v. Attached to this screw is an excentric escapement u, and at the upper extremity a pencil, which is pressed against the roller, whenever the excentric, revolving with the screw, causes the little spring lever u t to press it down. As soon as, by means of this arrangement a dot is made on the roller, the escapement allows the lever to fall off, thus releasing the pencil which is now brought into its original position again by the aid of a little spring within the small cylinder forming the receptacle of the whole. The screw revolves freely in a hole in this pencil apparatus, which is prevented from participating in the revolution by small pieces of brass sliding between the bars α, α . With every revolution of the screw a dot is produced on the paper, whilst at the same time the pencil is pushed farther on by one winding of the screw, thus preventing the coincidence of two consecutive dots. If we therefore direct the telescope of the instrument towards a certain star, and cause the pencils of both apparatus' to make impressions on their respective rollers, in the manner just described, and then turn the telescope towards a second star, noting in a like manner its position on the rollers, we may readily

* The drawings on plate 17^b (22) are made after an instrument of very superior workmanship of Mr. H. Schreiber of Melbourne.

obtain the differences in declination and rightascension of the two stars by reading off the respective circles. In case the pencil has been moved to the end of the roller; during the frequent repetition of this process, the spring lever *u t* is taken off and the screws moved backward, drawing also the pencil apparatus back to the lower end of the roller.

The mode of observing with the meteorograph is now quite intelligible to any one conversant with the theory of equatorial instruments generally, and there are but a few remarks to be added respecting the observations on shooting stars by the aid of this instrument, and the manner in which I propose to read and record the results.

The instrument must either be placed in the open air, and in that case it is on a movable stand, as seen in our drawing (Fig. 4); or it is intended to be put up in a little house of which the roof may be removed so as to allow of a commanding view over the entire horizon. In the latter case the instrument may be mounted in a permanent manner upon a stone pillar, the adjustments being identical with those of other equatorial instruments, as described in any epitome on practical astronomy. The instrument with a movable stand should be placed on three logs of wood, firmly rammed into the ground. The legs of the tripod ought to be screwed to these logs, in order to insure stability and to facilitate the preparation of the instrument for observation. By means of the screws *r, r, r* (Figs. 1 and 2) the top-plate is levelled, while the central screw *q* and *P* serves to draw it towards the fixed part of the stand *F G*. Under the supposition that the polar axis is but a few degrees off the plane of the meridian, a close adjustment may be effected by using the tangential screw *O*. It is now to be examined, whether the polar axis is elevated to the altitude of the pole and in the plane of the meridian; whether the line of collimation of the telescope is perpendicular to the declination axis, and the latter at right angles to the polar axis. The index of the hour circle should indicate zero when the telescope is in the meridian, while that of the declination circle ought to point to zero when the line of collimation is parallel to the equator.

There is, moreover, attached to the stand the key of a chronograph in *N* (Fig. 4), the wires *N, P* leading to the Observatory. A small lamp may be placed inside the box of the tripod, so as dimly to illuminate the pane of ground glass in *M*, upon which all remarks respecting colour, duration, and other particulars may be noted; and, should there be no chronograph at command, a part of the glass left unground may admit of the time being noted by a watch kept within the box.

The observer, who keeps his finger in contact with the key of the chronograph, has, as soon as he sees a meteor, to note the time, and to watch its course with respect to the point of starting and extinction, referring them to some neighbouring stars; and then point the telescope* alternately to those two points, registering in both cases, by the aid of the screws and pencils, declination and rightascension. In order that no delay in directing the telescope may occur, neither of the rollers is clamped, but a spring enclosed in two cylinders (*h*), overlapping one another, causes the rollers to be kept in their position without offering too much resistance to the moving of the telescope in any direction. This arrangement has the advantage of admitting of an immediate pointing of the telescope, whilst, where clamping screws are used, a loss of time is unavoidable. It is proposed to register occasionally, while engaged in the observations on meteors, a well determined fixed star or a planet, with the object

* In fixing the telescope towards the points of the sky to be noted, it is not necessary to look through the telescope; an arrangement with diopters attached to it, so as to be parallel with its line of collimation, answers far better.

of exerting a check on the work. The observations thus collected may be read off to a great nicety (to a quarter of a degree with the first constructed meteorograph) by the aid of the index, and entered in a register with ease during day time. If necessary, the paper round the rollers is renewed, and the screws are reset for work.

It will indeed not be difficult now, after being made acquainted with the principles on which the meteorograph is constructed, to decide upon a plan of systematic record, which will have to include: the time appertaining to a certain mark on the paper, right ascensions and declinations of meteors and neighbouring stars, the strictest accordance between the records of the chronograph and the remarks, and also the notations of the instrument. With regard to the last point precaution must be taken against any mistake occurring in respect to the position of the telescope, whether the same is "direct" or "reversed."

I consider it hardly necessary to dwell upon the great advantages of this mode of observing meteors over the usual plan, by the aid of star maps or estimated positions, as neither of them presents equal guarantees for expediency and accuracy of observation. The trials made, during the short time the instrument was in use at the Observatory, have fully borne out this assertion. Not pretending to have suggested an instrument in every respect perfect, I feel convinced that its construction and general adoption will be a step in the right direction, in order to insure observations upon which we may place greater reliance than we have hitherto been able to do.

Investigation on 2088 meteors observed between the 1st of March, 1858, and the 28th of October, 1863, at the Flagstaff Observatory in Melbourne, by Dr. Edward Heis, Professor at Münster.

64. It has afforded the author of this treatise great pleasure to comply with the wishes of the late director of the Flagstaff Observatory at Melbourne, *Dr. George Neumayer*, to subject the observations on luminous meteors in the Southern hemisphere, made by himself and his assistants, to a rigorous examination. These observations, effected with great care and with continual regard to all circumstances, are of great importance, because they form the very first series made in the Southern hemisphere of our earth, according to the same plan which, for a considerable number of years, has been employed by several observers in the Northern hemisphere with great success.

The number of meteors turned to account in this investigation amounts to 2088, which are arranged in the register of the Observatory according to date, hour, and minute (Melbourne Mean Time). In addition to magnitude, colour, etc., the positions of most of that number are accurately recorded, and in this case either the right ascension and declination (March the 1st, 1858, to February the 28th, 1859),* or the altitude and azimuth of the appearance and disappearance. The latter have been transformed by the aid of tables, computed for the latitude of Melbourne (37°·8 South), into declination and right ascension.

* The observations for March 1st, 1858, to February 28th, 1859, are contained in "Results of the Magnetical, Nautical, and Meteorological Observations made and collected at the Flagstaff Observatory, Melbourne." (pag. 84 — 97.)

The following questions have been answered in the subsequent pages:

1. What change is the number of meteors subjected to in the course of the year?
What are the periods of the year, doubtlessly and clearly characterized as such, during which an extraordinary number of meteors regularly return?
2. What are the results with regard to their colour?
3. What are the extraordinary phenomena observed with respect to the brightness of meteors?
4. What are the radiant points of meteors during the various months of the year?

It is now universally admitted that meteors are small cosmic bodies which move round the sun in elliptic orbits, coming in contact with the orbit of our earth, either singly, in more or less crowded clusters, or in complete rings. On the place of intersection of the earth's orbit and the orbits in common described by shooting stars, depends the time of the year when meteors, distinguished by number and brightness, begin to glow and become visible on entering the atmosphere. Those parts of these orbits of meteors in the vicinity of our earth are to be regarded as being nearly straight and parallel; they appear all, however, to the observer's eye according to the laws of perspective, to emanate from one point, "the radiant." The position of the radiant on the celestial globe determines the *relative* direction of motion of the meteors, whilst the absolute direction would be obtained by taking also the motion of our earth into consideration.

We readily comprehend now that only those meteors appear *equally* frequent in the Northern and Southern hemispheres, the radiants of which are situated near the equator of the heavenly globe; but that numerous meteors, with radiants situated at a smaller or greater distance from the equator towards the North, are especially visible in the Northern hemisphere of our earth, and vice versa. There is therefore nothing astonishing in the fact that the periodical showers of meteors in July, August, October, November, and December are in the Southern hemisphere either not at all, or at least but partially, visible.

A long continued series of observations on the meteors of the Laurentius period (8th—10th of August), for instance, gives us the following radiants:

1. A_{11} : $\alpha = 51^\circ$, $\delta = +55^\circ$; 2. B_5 : $\alpha = 297^\circ$, $\delta = +68^\circ$; 3. N_{13} : $\alpha = 345^\circ$, $\delta = +85^\circ$.

The radiants B_5 and N_{13} are for Melbourne (37° 8' S. Lat.) totally below the horizon, and the radiant A_{11} is, at the time of its culmination at 6^h a.m., but one degree above the horizon.^{1*}

During the August period, in 1858, an extraordinary number of meteors was noted by several observers of the observatory at Münster; on the 8th of August, from 9^h 26^m to 12^h 3^m, 139; on the 10th of August, from 9^h 12^m to 12^h, 201; and on the 12th of August, from 9^h to 12^h, 113 single meteors. According to the Register of meteors of the Flagstaff Observatory, in the same year and during the same period of August, on the 7th, from 12^h 35^m to 12^h 54^m, not a single meteor was seen; on the same day, from 5^h 20^m to 5^h 40^m, one meteor; and at 6^h 13^m another.

The meteorological diary of the Austrian *Frigate* "Novara," then on her voyage round the globe, which was at the same time in August, 1858, at anchor in Shanghai, makes mention of a great many shooting stars during the evenings of the 6th and 8th of August; but the latitude of the place of observation is 31° 15' North. In the preceding year, about the time of the August period of meteors, the same frigate was at Rio Janeiro (22° 54' South), but the meteorological diary mentions expressly that, on the 10th of August, 1857, not a single meteor was seen; whereas at Münster, on the 11th of August, between 8^h $\frac{3}{4}$ and 11^h $\frac{1}{4}$, 85 meteors were observed.

* This and the following figures refer to the Author's notes on the above paper of Professor Heis, beginning on page 134.

The subjoined table gives for every day the number of meteors observed at Melbourne during the time from the 1st of March, 1858, to the 28th of October, 1863. Although in this table the hourly number of meteors, seen by one observer, is not given, it shows nevertheless to perfect satisfaction at what time of the year an extraordinarily large number of meteors was seen.

TABLE SHEWING THE NUMBER OF METEORS OBSERVED AT MELBOURNE

FROM THE 1st OF MARCH, 1858, TO THE 28th OF OCTOBER, 1863.

(Total number of meteors 2088.)

Date	January	February	March	April	May	June	July	August	Septemb.	October	Novemb.	Decemb.	Date
1	4	4	3	8	2	—	1	17	9	6	—	3	1
2	—	17	1	2	3	—	2	15	8	7	4	2	2
3	—	10	—	13	—	17	17	7	4	4	7	—	3
4	4	13	2	3	2	18	—	10	4	4	1	5	4
5	—	4	7	5	4	8	10	23	5	7	—	—	5
6	5	3	9	5	—	6	—	22	—	4	1	13	6
7	2	2	2	3	2	25	2	26	5	1	4	1	7
8	18	—	12	9	19	1	2	2	2	—	2	—	8
9	8	1	1	7	3	13	7	11	13	—	6	—	9
10	13	5	1	—	13	11	5	12	2	2	—	—	10
11	—	1	1	—	2	14	2	17	7	10	—	—	11
12	1	3	24	7	16	10	3	—	3	5	—	32	12
13	—	3	17	—	12	10	11	14	1	2	—	9	13
14	5	1	4	3	7	18	9	5	—	—	4	4	14
15	3	2	24	—	11	2	1	10	2	—	6	2	15
16	2	6	—	11	7	3	4	—	1	13	2	5	16
17	1	6	12	5	21	10	1	1	2	6	—	8	17
18	—	7	2	12	9	5	18	2	6	5	4	20	18
19	11	8	8	12	—	8	18	—	3	3	4	8	19
20	6	—	10	6	—	—	5	14	3	2	—	—	20
21	7	7	11	3	2	4	3	6	2	2	5	—	21
22	1	13	—	2	2	2	2	3	1	13	—	3	22
23	1	3	2	2	7	17	1	2	—	6	—	7	23
24	—	11	10	12	3	2	1	4	4	—	—	3	24
25	2	4	—	13	13	1	6	—	1	41	3	23	25
26	1	14	3	1	2	4	3	1	1	10	2	—	26
27	17	1	12	10	2	6	18	1	6	5	4	2	27
28	18	18	5	5	12	—	39	5	2	7	—	8	28
29	2	—	—	8	1	1	7	8	4	—	—	7	29
30	17	—	3	3	5	2	16	—	4	18	5	—	30
31	14	—	—	—	—	3	26	—	—	1	3	—	31
Number for every month.	163	167	186	170	182	221	240	238	105	184	67	165	Number for every month.
Deviation from the mean number.	—	—	+ 12	—	+ 8	+ 47	+ 66	+ 64	—	+ 10	—	—	Deviation from the mean number.
	— 11	— 7	—	— 4	—	—	—	—	— 69	—	— 107	— 9	

The mean number for the month is therefore 174.

According to the above table, the months of June, July, and August are particularly rich with regard to meteors; on the other hand the months of September and November are poor.

On glancing at the above table, we notice that, during several periods of the year, a particular frequency of meteors makes itself manifest, whilst others are characterized by an absence of them. In examining those periods of shooting stars, appertaining to the Southern hemisphere and deviating from those of the Northern, I have also taken into consideration the few observations made in other localities in the Southern hemisphere, namely to several observations made at other stations in the Colony of Victoria by *Dr. Neumayer*, but especially to those recorded on board of H. I. M. frigate "*Novara*" on her voyage round the world during the years 1857, 1858, and 1859, at different parts of the Southern hemisphere. *

MAXIMA AND MINIMA OF APPEARANCES.

65. The time from the 7th to the 10th of January² is remarkable at Melbourne for an uncommonly large number of meteors, especially in the year 1861. *Mr. Moerlin* who was in St. Kilda on the 8th observed, between the hours of 8^h and 9^h 30^m, about 15 shooting stars. On board the *Novara*, on the 6th of January, 1858, en route from *St. Paul* to *Point de Galle* ($\phi = +5^\circ$, $\lambda = 79^\circ$ E.) ** a fireball with a reddish glare was seen in the Southern sky.

The time between the 11th and 26th of January³ is poor in shooting stars; the frigate *Novara* also does not make mention of a single meteor; whereas, from the 27th of January to the 4th of February, occurs a period of frequency, especially in the years 1859 and 1860. The meteors are in some cases remarkable for great brilliancy. We subjoin the following:

"Nr. 235 1859 Jan. 30th 8^h 42^m; as large as Jupiter, yellowish white.

"Nr. 236 1859 Jan. 30th 8^h 44^m; brighter than Jupiter; at its disappearance the meteor parted into two equal halves, one of which preceded the other by about one degree, and disappeared suddenly.

"Nr. 249 1859 Jan. the 31st 16^h 47^m; brighter than Venus. Very beautiful meteor.

"Nr. 814 1860 Jan. the 28th 7^h 50^m; like Jupiter.

"Nr. 828 1860 Jan. the 28th 11^h 16^m; of 1st magnitude.

"Nr. 832 1860 Jan. the 29th 15^h 17^m; of 1st magnitude; a splendid meteor with a blue train of light behind it, bursting with great splendour.

"Nr. 841 Jan. the 30th at 15^h 53^m; 1st magnitude."

Mr. Becker of the Victorian Exploring Expedition reports as follows:

"*Bodurga*, between the Darling and Cooper's Creek, on the 1st of February, 1861, at 12^h 15^m, saw a splendid meteor moving perpendicularly in NE by N; commenced at about 10° above the horizon, fell slowly for some time (7 seconds); three times the size of Venus when it reached the horizon. It fell not with a steady motion, but appeared to meet with resistance on approaching the horizon, when its motion was diminished, and it moved by fits and starts.

* These observations are embodied in the III volume of "*Reise der österreichischen Fregatte Novara um die Erde in den Jahren 1857, 58, und 59, unter dem Befehle des Commodore B. von Wüllerstorff-Urbair, Nautisch-Physikalischer Theil, meteorologisches Tagebuch, Wien, 1865.*" I am indebted for a copy of this work to the kindness of Baron v. Wüllerstorff.

** ϕ denotes the latitude, + when North, — when South; λ the longitude from Greenwich.

The colour was in the beginning light blue, subsequently red, and in the centre yellow. No report. ($\phi = -31^{\circ}2$, $\lambda = 9^h 28^m$ E)."

After the 4th of February the number of meteors diminishes towards the end of the month, but on board the *Novara*, en route from *Auckland* to *Papiete* (Tahiti), a few days after the 4th of February in 1859, the 6th, in ($\phi = -22^{\circ}$, $\lambda = 10^h$ W), and the 7th of the same month, in ($\phi = -21^{\circ}$, $\lambda = 10^h$ W), a great number of meteors were observed; moreover very bright shooting stars were seen in 1859, on the 11th of February, when at anchor in *Papiete* ($\phi = -17^{\circ}40'$, $\lambda = 9^h 59^m$ W), as well as in 1858, on the 12th, 13th, 14th, and 15th ($\phi = +13^{\circ}$, $\lambda = 5^h 32^m$ E) when en route from *Madras* to the *Nicobares Islands*.

Mr. Becker of the Victorian Exploring Expedition reports: "*Torowoto*, twenty miles beyond it towards Cooper's creek ($\phi = -29^{\circ}7$, $\lambda = 9^h 31^m$ E), on the 16th of February, at 7^h 34^m, a meteor was seen in the NE, six degrees towards the East of Jupiter; brilliant green, fell in a curved line, the convexity towards N. No tail, no report, no sparks."

The year 1859 gives, for Melbourne, an extraordinarily large number of meteors towards the end of February, some of them of 1st mag. At the beginning of March the appearance is again insignificant; whilst, on the other hand, on board of the *Novara*, en route from *Papiete* to *Valparaiso*, in a Southern latitude from 16° to 13° , many shooting stars were recorded on the 1st, 2^d, 3^d, and 7th; in the evening of the last named day a fire ball was observed of 30 seconds duration.

At *Melbourne* the time between the 12th and 15th of March appears to be very remarkable for the frequency of bright meteors, especially in the year 1861. The *Frigate Novara* mentions likewise about this time many shooting stars; for instance, in 1859, when she was on her voyage from *Tahiti* to *Valparaiso*, on the 15th of March ($\phi = -15^{\circ}$, $\lambda = 9^h 20^m$ W) and on the 16th ($\phi = -15^{\circ}$, $\lambda = 9^h 16^m$ W), meteors being visible towards Southwest.⁵

April shows, for Melbourne, a moderate number of shooting stars, and there is no trace to be perceived of the frequent occurrence about the 11th, as observed on board the *Novara* in 1859 ($\phi = -35^{\circ}$, $\lambda = 5^h 56^m$ W). In 1858, on the 14th and 17th of April, not a single shooting star was observed, notwithstanding a good look-out was kept for several hours, the sky being exceedingly clear.⁶

In the month of May the time about the 8th and the 17th is remarkable for an exceedingly large number of bright meteors. The register records: "Nr. 1041 May the 19th 1860 11^h 10^m, brilliant meteor, nucleus red and brighter than the brightest star, dropped red sparks in passing through the air; Nr. 1461 May the 16th 1861 10^h 55^m, brighter than Venus, white strongly flickering light like a flame; Nr. 1466 May the 16th 1861 14^h 1^m, brighter than Jupiter, tail visible for one minute, very brilliant; Nr. 1468 May the 17th 1861 5^h 23^m, very large meteor, like a fire ball, most brilliant; Nr. 1469 May the 17th 1861, 8^h 49^m, first magnitude, moving in a zig-zag line."⁷

The *Novara* mentions likewise, about the middle of May, 1859, when at sea off *Valparaiso*: May the 13th ($\phi = -32^{\circ}$, $\lambda = 5^h$ W) many shooting stars, and during the night of the 14th, in ($\phi = -35^{\circ}$, $\lambda = 5^h$ W), a fire ball in NNW.

Towards the 25th of May there were many shooting stars observed at Melbourne, and the *Novara* also mentions, for 1859, a tolerably large number of meteors on the 24th of May ($\phi = -53^{\circ}$, $\lambda = 5^h 24^m$ W) and on the 25th ($\phi = -55^{\circ}$, $\lambda = 5^h 8^m$ W).

The time from the 3^d to the 7th, and also from the 8th to the 14th of June, is, at Melbourne, very rich in meteors, particularly during the years 1858, 1861, and 1862. Worthy of being

mentioned are: Nr. 1493 June the 4th 1861 at 7^h 40^m, brighter than Jupiter; 1507 June the 7th 1861 at 9^h 36^m, first magnitude, intensely bright.

On the night from the 12th to the 13th of June, 1861, at several places in the Colony of Victoria,* a surprising number of shooting stars and fire balls were seen in the sky. As seen from *Port Elliot* in South Australia ($\phi = -35^{\circ}6$, $\lambda = 9^h 15^m$ E), a fire ball remained visible for half an hour, from which shooting stars emanated like sparks; while in the vicinity of Tanunda S. A. ($\phi = -34^{\circ}7$, $\lambda = 9^h 20^m$ E), as far as we could learn, a large meteor and an unusually great number of "falling stars" were noticed.

The *Novara*, on her voyage from *Valparaiso* to *Gibraltar*, makes mention of many shooting stars for: "1859 June the 2^d ($\phi = -51^{\circ}$, $\lambda = 2^h$ W), June the 10th ($\phi = -33^{\circ}$, $\lambda = 2^h$ W), June the 12th ($\phi = -29^{\circ}$, $\lambda = 1^h 56^m$ W), June the 18th ($\phi = -17^{\circ}$, $\lambda = 1^h 48^m$ W)." ⁸

On July the 3^d (especially in 1859) many very bright meteors were observed at Melbourne; also on board the *Novara*, on the 1st and 2^d of July of the same year, when in latitude 12° and longitude $1^h 56^m$ W.

At Melbourne the 18th and 19th of July (especially 1860), are remarkable for the frequency of bright meteors, likewise the time from the 27th of July to the 2^d of August.

The frequency of meteors manifested itself also after the middle of July on board the *Novara*, in 1857, after having crossed the line on her voyage from *Funchal* to *Rio Janeiro*. Special mention is made of: "1857 July 17th ($\phi = -2^{\circ}$, $\lambda = 2^h 12^m$ W); July the 18th ($\phi = -3^{\circ}$, $\lambda = 2^h 12^m$ W) a fire ball at 3^h a. m.; July the 21st ($\phi = -6^{\circ}$, $\lambda = 2^h 16^m$ W); July the 22^d ($\phi = -5^{\circ}$, $\lambda = 2^h 12^m$ W); July the 23^d ($\phi = -6^{\circ}$, $\lambda = 2^h 12^m$ W) frequent shooting stars, mostly moving towards SE; July the 25th ($\phi = -8^{\circ}$, $\lambda = 2^h 16^m$ W); 26th of July ($\phi = -9^{\circ}$, $\lambda = 2^h 16^m$ W); July the 27th ($\phi = -11^{\circ}$, $\lambda = 2^h 20^m$ W) many shooting stars in all directions; July the 28th ($\phi = -14^{\circ}$, $\lambda = 2^h 24^m$ W) many shooting stars, one observer saw, from midnight to 4^h a. m., nearly 60; July the 29th ($\phi = -16^{\circ}$, $\lambda = 2^h 28^m$ W); one observer saw, from midnight to 4^h a. m., 40 shooting stars flying in all directions; July the 30th ($\phi = -18^{\circ}$, $\lambda = 2^h 28^m$ W); July the 31st ($\phi = -18^{\circ}$, $\lambda = 2^h 28^m$ W); August the 1st ($\phi = -19^{\circ}$, $\lambda = 2^h 32^m$ W); August the 2^d ($\phi = -21^{\circ}$, $\lambda = 2^h 36^m$ W) many shooting stars, one very bright."

At *Havanna* (23° North Lat.), from which place a large portion of the Southern heavens may be observed, *Mr. G. Poey* saw, from the 24th of July to the 11th of August, 1862, a total number of meteors equal to 884, the most of them during the nights of the 28th and 29th of July.⁹

After the 2^d of August there occurs a standstill at Melbourne lasting for several days; the *Novara* too does not make any mention of particular cases. It is true, the days of the 5th, 6th, and 7th show several meteors, but, as already mentioned above, the time from the 8th to the 10th of August (the *Laurentius* period of the Northern hemisphere) is surprisingly devoid of meteors; the observer on board the *Novara* expressly mentions that no meteors were seen while at anchor in *Rio Janeiro* harbour. Among the few seen at Melbourne are several distinguished by a particular lustre:

"Nr. 1110 1860 August the 5th at 8^h 5^m. A very brilliant meteor of the size of Venus.

"Nr. 1113 1860 August the 9th at 6^h 43, of the size of Mars; slowly moving meteor with a nucleus very much like that of a comet, leaving a fine train behind it."

* And South Australia.

On August the 11th, 1859, there were seen at Melbourne some very bright shooting stars (Venus, 1st and 2^d mag.); in 1863 there occurred a tolerably large number of shooting stars, on the 10th and 11th of August, especially towards and after midnight. The same applies to August the 20th.¹⁰

September¹¹ shows, generally speaking, few shooting stars; the same holds good for the first week of October, although towards the middle of the latter month a period of frequency for meteors occurs in the Northern hemisphere. Particularly remarkable for shooting stars is the 25th of October, 1859, when 41 meteors* were counted, up to near midnight, some of them being exceedingly bright.

The frigate *Novara* mentions, for the month of September, but few meteors. More for the time between the 15th and 24th of October: she was at that time only 8°—10° South of the Line, being thus in a position to view a large portion of the northern heavens.¹²

November is poor in meteors, especially the time from the 10th to the 13th. On the 4th of November, 1857, several shooting stars were seen on board the *Novara* ($\phi = -40^\circ$, $\lambda = 1^h 40^m$ E) on her route from *Simonstown* to *St. Paul*; on the 11th and 12th of November, 1858, the *Novara* was lying at anchor in Sydney harbour ($\phi = -31^\circ 51'$, $\lambda = 10^h 5^m$ E), and although the sky was perfectly clear, no meteor was observed. *Sir John Herschel*, who made observations on shooting stars at the Cape of Good Hope in November, 1836, counted, during the two nights of the 12th and 14th, only a total number of 18 meteors; whilst in the same year, at Paris, during the night from the 12th—13th, 170; at Frankfurt 155; at Düsseldorf 306; but during the night from the 13th—14th at Breslau, from 3^h to 6^h a.m., 146 meteors (4 larger than Venus, 13 of the size of Jupiter, and 33 of the 1st magnitude); and during the night from the 14th—15th, from 7½ p. m. to 5½ a. m., in the same locality, 142 shooting stars were observed.¹³

In the month of December, at Melbourne, the times about the 12th (especially 1860) and about the 18th (likewise 1860), as well as about the 25th, are remarkable for the occurrence of meteors. The *Novara* reports, when on her route from *Sydney* to *Auckland* (32° to 33° South Latitude), frequent fall of meteors; likewise many meteors were observed on the 20th of December, 1857, on the voyage from *St. Paul* to *Point de Galle* ($\phi = -16^\circ 5'$, $\lambda = 9^h 40^m$ E).¹⁴

Particularly distinguished for the frequency of the fall of shooting stars are therefore:

1. 28th of January to the 2^d of February; 2. From the 12th to 15th of March; 3. Middle of May; 4. Beginning of June; 5. 28th of July to the 2^d of August (very clearly expressed); 6. the 5th, 6th, 7th of August; and 7. the 25th of December.¹⁵

COLOUR OF SHOOTING STARS.

66. The observers at Melbourne payed particular attention to the notation of the colours of meteors, not only distinguishing the principal colours, but also the various more delicate shades which meteors exhibited in their state of glowing.

* Three observers being engaged on this occasion.

Of 766 single meteors the colours noted are as follows:

I White		II Yellow		III Red		IV Blue		V Green	
white	 321 met.	yellow	 123 met.	red	 113 met.	bluish	 14 met.	green	 1 met.
whitish	 7 „	yellowish	 42 „	reddish	 27 „	light blue	.. 2 „	whitish green	1 „
dazzling white	1 „	pale yellow	... 25 „	pale red	 1 „	pale	„ .. 1 „	pale green	.. 1 „
very white	.. 1 „	dark	„ .. 15 „	dark red	 4 „	bright	„ .. 1 „	greenish	.. 2 „
yellowish	... 17 „	light	„ .. 1 „	intense red	... 1 „	Summary I White = 366 meteors. II Yellow = 224 „ III Red... = 153 „ IV Bluish. = 18 „ V Green . = 5 „ Total = 766			
bluish	 8 „	whitish	„ .. 2 „	brilliant reddish	1 „				
greenish	 1 „	bright	„ .. 2 „	bright red	 1 „				
bright white	1 „	reddish	„ .. 13 „	orange red	.. 2 „				
brilliant	„ 8 „	greenish	„ .. 1 „	orange purple	1 „				
gray	 1 „			yellowish red	1 „				
				brilliant purple	1 „				

BRIGHTNESS OF METEORS.¹⁶

67. In addition to those meteors already described above, as having been distinguished for a suprising degree of brightness, the following may yet be enumerated:

“Nr. 296 1859 Feb. 24th 8^h 28^m. A bright meteor near the South pole, without motion. It appeared and disappeared at the same place.

“Nr. 848 1860 Feb. 6th 13^h 6^m. This meteor was like a fire ball; it moved very slowly, requiring about 20 sec. for its short and slightly curved course. The tail (about 1 degree) left a few red sparks behind. There was a distinctly perceptible shading, from the white of the centre of the nucleus to the red of its parts towards the tail and the tail itself, somewhat similar to a bar of red-hot iron with a whitish tip.”

“Nr. 974 1860 April 1st 14^h 50^m. Meteor much larger than any star, a very brilliant fire ball.”

On the 10th of October, 1860, Mr. L. Becker saw at the Darling a splendid meteor, at 10^h 30^m.

“Nr. 1185 1860 October the 17th 9^h 24^m. A meteor with brilliantly red, flickering light.

“Nr. 1181 1860 November the 18th 9^h 35^m. Most brilliant intensity of light, alternately decreasing and increasing during its slow descent; red sparks issuing in all directions.

“Nr. 1406 1861 April the 5th 13^h 3^m. Most brilliant meteor, at least twice the size of stars of first magnitude, increasing considerably in size when descending, throwing off a great number of vivid sparks.

“Nr. 1482 1861 May the 28th 8^h 20^m. A meteor with a flickering light, which seemed to be caused by the rotatory motion of the body of the meteor, as if only one side was bright like a bombshell with the fuse burning.

“Nr. 1483 1861 May the 28th 8^h 24^m. Red nucleus, with tail and red sparks.

“Nr. 1698 1861 September the 7th 11^h 40^m. Meteor larger than Venus, most brilliant, changing its colour from yellow to bluish white in the middle of its course.

“Nr. 1713 1861 November the 3^d 9^h 45^m. Intense light, emitting a few sparks when disappearing.”

On the 3^d of January 1862 a most brilliant meteor was seen, at 9^h 15^m, at Geelong. It pursued a course exactly like that of a Roman candle, as if it had been projected from the

earth. Its colour was a very vivid pale green; but on reaching its greatest elevation it divided into two, the large green ball being followed by a smaller one of bright red. ("Geelong Advertiser," Jan. 3.)

On the 18th of June, 1862, at 6^h 22^m, a splendid meteor was seen at Adelaide and Lacedpede Bay.*

On the 5th of July, 1862. From the "Grenville Advocate:" "A large ball of fire, of exceeding whiteness was seen to fly through the air."

"Nr. 1837 1862 November the 30th 7^h 40^m. Fine meteor, distinctly seen in bright moonlight, seemed very near. Flickering just before disappearance, and decreased in size.

"Nr. 1850 1863 January the 21st 11^h 30^m. A meteor like Venus, very rapid motion, and illuminating objects like lightning.

"Nr. 1851 1863 January the 30th 8^h 38^m. Like Jupiter, very brilliant."

RADIANT POINTS FOR THE SOUTHERN HEMISPHERE.¹⁷

68. The radiant points (points of radiation or divergence) have been determined by means of projecting the points of the beginning and the end of the flight of meteors, according to declination and rightascension, either on an accurately divided celestial globe of 30 inches diameter, or by drawing the same on a chart constructed on the principle of the central-projection. Such a chart, constructed under the supposition that the eye of the observer is placed in the centre of the celestial globe, has, as is readily understood, the peculiarity that all great circles appear as straight lines. With a view to determine the radiant points (i. e., those points in which the apparent orbits of shooting stars, appertaining to one and the same system, intersect one another, if produced backward), on the celestial globe the curvilinear, or on the chart the rectilinear flights, were produced backward, whereby those spots resulted in which a larger or smaller number of lines meet either in a point or in a small space.

The projection of meteors was effected month by month. The subsequent results concerning radiant points, as determined for the several months, are, however, to be regarded as being only preliminary; by a long continued series of reliable observations, made in the Southern hemisphere, we shall be enabled to determine the position of the radiant points with all possible accuracy.

The ascertained points of radiation appertain nearly all to the Southern hemisphere; some few found for February, March, April, and May, coincide with the radiant points, at one time determined by myself (for the same periods), and are for this reason marked by the same letters, S₁, S₂, S₄, and S₆, which I applied. The radiant Ξ_2 closely corresponds with T₄. The other Southern radiant points are marked by Greek capital letters Γ , Δ , H, and so forth. With respect to the Southern radiant points, as determined from month to month, we elicit the fact, as is the case with those of the Northern hemisphere, that some radiant points are to be found from month to month in the same region of the heavens; such radiant points, forming a group, are designated by the same letters, which are again distinguished among themselves by attached marks. The month

* See note 8.

of December, for instance, shows the radiant Γ_1 ($\alpha = 115^\circ$, $\delta = -38^\circ$), the month of January the radiant point Γ_2 ($\alpha = 105^\circ$, $\delta = -27^\circ$), and the month of February Γ_3 ($\alpha = 105^\circ$, $\delta = -45^\circ$).

The active director of the observatory at Athens, *M. J. Schmidt*, is disposed to recognize, from his observations on shooting stars made at Athens, Southern radiant points; the exact results of his investigations are, however, not yet published. There cannot exist a doubt but that several of the radiant points, determined by him, will prove to coincide with those about to be mentioned as the result of my inquiry. We subjoin, in the following table, the radiant points as determined for the single months, their designation, their position according to rightascension and declination, the constellation in which they are to be found, and lastly, the number of single meteors from which the radiant points were derived.

RADIANT POINTS OF SHOOTING STARS IN THE SOUTHERN HEMISPHERE.

MONTHS.	Designation.	POSITION.		Constellation.	Number of meteors.	MONTHS.	Designation.	POSITION.		Constellation.	Number of meteors.
		α	δ					α	δ		
January	Γ_2	105	- 27	Can. mai.	30	July	Λ_4	284	- 40	Corvus	13
	Δ_2	145	- 40	Argo navis	18		O_2	258	- 20	Ophiuchus	11
February	Γ_3	105	- 45	Puppis Argo	15	August	Π	354	- 46	Phoenix ¹⁸	30
	Δ_3	174	- 52	Centaurus	21		P	50	- 85	Octans	13
March	S_1	174	+ 16	Leo mai.	3		Ξ_2	305	+ 5	Delphinus	16
	Γ_4	125	- 38	Argo navis	12		Λ_5	250	- 35	Scorpius	10
	Δ_4	174	- 30	Hydra	10	September	Σ_1	337	- 10	Aquarius	23
	H_1	192	- 38	Centaurus	15		Y_1	325	- 38	Grus	32
April	S_2	181	+ 6	Virgo	11		Σ_2	346	- 3	Aquarius	9
	H_2	194	- 30	Centaurus	48		Y_2	305	- 36	Sagittarius	9
	Λ_1	280	- 38	Telescopium	13	October	Φ	340	- 30	Piscis austrinus	14
	Γ_1	126	- 42	Argo	20		X_1	10	- 35	Piscis austrinus	12
May	S_4	185	+ 22	Coma Berenices	8		Σ_3	347	- 11	Pisces	11
	H_3	212	- 49	Lupus	20		Ψ	50	- 4	Eridanus	13
	Λ_2	248	- 46	Norma	15	November	Y_3	307	- 47	Indus	18
	S_6	202	+ 9	Virgo	6		X_2	22	- 35	Cetus	12
June	Λ_3	253	- 37	Scorpius	10		Ω_1	90	- 34	Columba	12
	O_1	269	- 11	Sagittarius	15		Ω_2	85	- 37	Columba	21
	Ξ_1	305	- 7	Capricornus	11	December	Γ_1	115	- 38	Argo	23
							Δ_1	148	- 34	Antlia pneumatica	24

The accompanying chart, see plate 17 a (21), shows the exact position of the various radiant points for the Southern hemisphere. Such radiant points appertaining to one and the same group are enclosed within a circle or an ellipse. In the subsequent table we give a survey of the groups, together with the data respecting the position of their centres, according to rightascension and declination, and the constellation; likewise the single months during which the radiant points occur; and lastly, the number of shooting stars appertaining to one and the same group:

	Designation.	POSITION		Constellation.	MONTHS.	Number of observ.
		α	δ			
1	Γ	115	— 34	Argo navis	December, January, February, March, April	100
2	Δ	162	— 40	Antlia pneumatica	December, January, February, March	73
3	H	206	— 37	Centaurus	March, April, May	83
4	Δ	266	— 41	Telescopium	April, May, June, July, August	61
5	Ξ	305	— 1	Aquila	June, July	27
6	O	264	— 17	Ophiuchus	June, July	26
7	Π	354	— 46	Phoenix	July ¹⁸	30
8	P	50	— 85	Octans	July	13
9	Σ	342	— 8	Aquarius	August, September, October	43
10	Y	315	— 40	Microscopium	August, September, October	59
11	Φ	340	— 30	Piscis austrinus	September	14
12	X	16	— 35	Cetus	October, November	24
13	Ψ	50	— 4	Eridanus	October	13
14	Ω	86	— 35	Columba	November, December	33
15	S	188	+ 13	Virgo	February, March, April, May	28

From an inspection of the ecliptic, traced in the accompanying chart, we may derive the following relations to it. Most of the groups lean against the ecliptic, and are partly to the south, partly to the north of it.

The group of the Σ 's is close to the ecliptic (Σ_4 on the ecliptic). The groups Φ , Y, Λ , H, and Ψ have nearly the same distance from the ecliptic. The groups X, Π and Δ have a distance of nearly 45° , and the groups Ω and Γ a distance of 60° from the ecliptic. P, in the close vicinity of the South Pole of the equator, is 70° distant from the ecliptic. North of the ecliptic, at the small distance of 10° , we find the groups Ξ , O, and S. ¹⁹

Concerning the periodical occurrence of shooting stars in August, and especially in November, the fact was established, that nearly all directions, produced backward, meet in a point of the same longitude as the one towards which the earth is then moving, the tangential point. In respect to shooting stars of the Southern hemisphere a similar relation is to be noticed, as far as meteors

are concerned with the radiant Λ , ($\alpha = 280^\circ$, $\delta = -38^\circ$), in April; and also with respect to meteors, having for a radiant Δ , ($\alpha = 148^\circ$, $\delta = -34^\circ$). The positions namely of the tangential-points are, for the middle of April ($\alpha = 296^\circ$, $\delta = -21^\circ$), and for the middle of December ($\alpha = 175^\circ$, $\delta = +2^\circ$).

69. NOTES BY THE AUTHOR.

1) The splendid meteor, Nr. 161, observed on the 6th of August, 1858, at 18^h 13^m, was traced back to the radiant $A_\circ$; and it is a fact worthy of being remarked, that it moved towards the radiant near the South Pole (P), whilst the large meteor seen on the 4th of March, 1861, (R. II. pag. 141) came from the latter radiant, and moved towards the radiant in Perseus ($A_\circ$).

2) Mr. F. Abbott of Hobarton ($\phi = -42^\circ 52'$, $\lambda = 9^h 49^m$ E) saw, on the 2^d of January, 1858, at 8^h 30^m, a large meteor of white colour, darting from σ Hydrae to the horizon, and passing on its way through Castor and Pollux; and another of very large size on the 9th, at 9^h 50^m, from α Columbae to the Hyades. On the morning of the 11th of January, 1864, between midn. and 4^h a. m., Mr. J. Bolton saw 8 meteors, one of them of a very large size; during the whole month this gentleman recorded 27 single meteors.

3) R. II. pag. 138. The hourly number of meteors reaches a high value between the 25th and 27th of this month, taking only those meteors into consideration which were observed up to the end of April, 1861. On the 24th, in 1863, a large fire ball was sighted in several parts of the Colony, but I could not get any information about its track, as at the time of its occurrence (8^h) a heavy thunderstorm prevented its being observed.

Mr. Todd, of Adelaide, reports a brilliant meteor in the South on the 1st of February, 1862, of three times the size of Venus and falling at right angles to the horizon.

4) Mr. J. Bolton observed 10 small meteors in four hours, on the 7th of February, 1864; and Mr. Abbott on the 11th, in 1856, many shooting stars. The latter gentleman observed at Hobarton, on the 26th, in 1858, at 11^h 5^m, a large meteor moving from σ Argus to β Horolog., and 6 during the whole month. Capt. Bardua, of the "Neckar," on his voyage from *Melbourne* to *Akyab*, observed ($\phi = -37^\circ$, $\lambda = 8^h 16^m$ E) a large meteor on the 26th, in 1862, at 10^h, and several small ones.

5) The largest meteor ever recorded at Melbourne occurred on the 3^d of March, 1861, at 21^h 38^m; it came from a point near the South Pole and moved towards the radiant near β Perseus (R. II. pag. 141). Mr. Abbott observed on the 15th and 19th of March, 1857, several meteors at Hobarton; and during this month, in 1858, 7 of considerable size were seen, one on the 10th, at 8^h 25^m, as large as Sirius, of pale yellow colour, moving from Saturn to the horizon in NW, and another on the 31st, at 8^h 10^m, white, and moving from γ Argus to η Orion.

Capt. Bardua, of the "Neckar," observed on the 28th of March, at 11^h 50^m, ($\phi = 0$, $\lambda = 6^h$ E) a very large meteor, in SSW 60° at the beginning, and disappearing in S 42° high.

6) The mean hourly number of meteors reaches its minimum value for the year during this month, according to the results of the inquiry (R. II. pag. 137). But this month is also distinguished for very brilliant meteors, with an apparent flight parallel to the ecliptic. Mr. Abbott records 6 meteors during April, in 1858, all of them of an exceedingly large size: on the 18th, at 8^h 44^m, one like Mars, very brilliant, tinged with blue, from the South Pole to a

point between α and β Centaur.; on the 24th, at 8^h 10^m, of $\frac{1}{3}$ of the diameter of the moon, pale white, from δ Can. mai. to α Hydrus — this meteor had a well-defined disk of about 10' diameter, and lasted 4 seconds; on the 24th of the same year, at 11^h 43^m, Nr. 50 of the catalogue, as large as Jupiter.

7) The mean hourly number increases in this month to 1.9, but with respect to size and direction the same may be said as in the preceding month. We glean the following remarks from Mr. Abbott's register: "On the 16th, in the year 1856, at 9^h, several shooting stars observed. In 1857 the weather has been exceedingly favorable for observations of this kind. Meteors have been seen of such extremely small dimensions as to appear only as moving points, while others of larger size, with long trains, have been projected in paths of considerable extent, and have taken every known direction on the 31st, at 7^h 55^m, a large meteor moving from the South Pole to Achernar."

In 1858, 5 were observed during this month, all of a very large size; two on the 23^d, one as large as Canopus, at 11^h 30^m, from β Cham. to β Dorad.; and on the 24th, at 5^h 5^m, a meteor of the size of Mars from ϵ Sagitt. to β Scorp.

8) The mean hourly number is in this month 2.8, and the hourly number for the period from the 2^d to the 10th of June is equal to 4.4, during which time the meteors are mostly large and their courses very long extended. The following special cases may be of interest. Mr. Abbott says, in his meteorological report for June, 1857: Several luminous meteors have been observed this month; the 1st, 9^h 15^m, a red colored shooting star, twice the size of Jupiter, between α and β Capric., it was quite stationary and seen for about two seconds." This case is particularly interesting, as affording a means of determining the radiant for this period of the year; it appears, namely, that the radiant Ξ corresponds nearest with the position resulting from this observation. But from Prof. Heis's investigations we may infer that during June the greater number of meteors are conformable in respect to this point Ξ .

When on a journey in connexion with the Magnetic Survey, I saw a splendid meteor on the 2^d of June, 1862, at 6^h 30^m, at Harrow ($\phi = -37^{\circ}2$, $\lambda = 9^h 26^m$ E); it emanated from Procyon and disappeared in ($\delta = +17^{\circ}$, $\alpha = 8^h 40^m$), had a very bright tail, and lasted 5 seconds. The evening being very bright, several more were seen.

Capt. Bardua, of the "Neckar," reports, on his voyage from *Akyab* to *Falmouth*, on the 4th of June, 1862, ($\phi = +8^{\circ}$, $\lambda = 6^h 20^m$, E) a large meteor, in NW 45° high when it appeared, and NW by N 20° high when it disappeared.

On the 5th of June, 1864, I saw at Melbourne a most magnificent meteor, at 7^h 30^m, of three times the size of Jupiter, and perfectly white. It came from β Libr., and disappeared in a point seven degrees above the horizon and in the azimuth of Jupiter, leaving a long train of light behind.

On the 6th of June, 1862, near Mt. Arapiles ($\phi = -34^{\circ}7$, $\lambda = 9^h 28^m$ E), I saw a beautiful meteor at 10^h 50^m, fully equal to Jupiter.

From Mr. Abbott's reports we glean further information on meteors during the month of June. In 1858 were seen 4 very large ones, viz: on the 13th two, one on the 14th, and another on the 15th, at 6^h 55^m, of the size of Venus, quite white, moving from δ Virg. to N. horizon. In 1857 on the same date, at 8^h 58^m, was seen a brilliant meteor, moving from ϵ Cent. to δ Argo of a bright yellow colour and leaving a train of light.

Mr. Todd, the director of the *Adelaide Observatory*, says in his meteorological report of 1862: "A gentleman saw a very large meteor on the 16th at North Adelaide ($\phi = -34^{\circ}9$, $\lambda = 9^h 15^m$ E). The same meteor was seen at Kingston ($\phi = -36^{\circ}9$, $\lambda = 9^h 20^m$ E). A rather remarkable meteor was witnessed here on the 16th, at about 7^h 15^m. A large body of fire shot across the heavens from East to West, and was accompanied by a loud report, similar to the discharge of a large cannon. In its passage it cast so strong a light as to render the minutest objects visible." On the 18th of the same year, at 6^h 22^m, another brilliant meteor was seen by Mr. Todd, of which this gentleman gives the following description: "I was returning to the observatory, when I suddenly saw a rather strong shadow of myself projected on the wall of a building facing due South, and immediately after observed a brilliant meteor a little to the East of, and about the same altitude as β Hydri, from which star its course was Westerly, passing near to γ Hydri, the Nubecula major, and finally exploding, without noise, near to or a little above and to the West of β Dorad. In brightness, I consider that it greatly exceeded Venus at her greatest brilliancy, casting a well defined shadow, and lighting up the whole of the Southern sky. It was of a bright yellow colour, with an elongated conical-shaped flaming tail, red and rugged at its edges and tip, with a slight waving motion, and occasionally leaving a small detached flame behind. I estimated the diameter of the ball to be about three minutes, or one tenth of the diameter of the moon....."

Mr. Chevalier, the well known artist, who accompanied me on several of my trips through, the Colony of Victoria, saw shortly after 16^h, on the 23^d of June, 1862, near Kilmore ($\phi = -37^{\circ}3$, $\lambda = 9^h 40^m$ E), within half an hour, 5 or 6 large meteors in the Southern sky moving towards the horizon.

In the Hobarton-reports for 1857, we find the following remarks: "On the 26th, from 9^h to 9^h 15^m, three bright meteors in the direction from Hercules to Corona Borealis, from Nubecula mai. to Canopus, and from Crux to Cham., everyone visible for one second. On the 28th at 7^h 40^m a very long and bright train meteor of 2^d mag. from Ara across the South Pole, motion very slow."

9) The mean hourly number of meteors for the month of July is not more than 2.7, although the hourly number for the period from the 26th to the 31st reaches the high value of 7.5 (taking only 1428 meteors into account, R. II. pag. 139).

On my voyage to Europe on board the "*Garrawalt*" ($\phi = -52^{\circ}$, $\lambda = 10^h 8^m$ W), the weather being not very favorable, I saw on the 4th of July, 1864, at 8^h 25^m, a meteor of a most brilliant glare. It moved from an altitude of 30° and in the azimuth of α Aquilae, to a point in 15° altitude and in the azimuth γ Delph. The nucleus was bright blue, and at least three times the size of Venus; it lasted from 4 to 5 seconds, and left a bright train just above δ Aquilae. On the same evening, at 10^h, I noticed another still brighter meteor, the course of which was parallel to that of the one just described.

Mr. Abbott reports, as having been seen at Hobarton on the 11th of July, 1857, at 7^h 20^m, a transient meteor from Libra to Bootes; at 8^h 2^m, a rapid meteor from Scorp. to Virgo. He says further: "On many of the clear nights in July, especially on the 21st, there appeared small meteors, both with and without train, in motion both slow and rapid, moving in every, known direction about the zenith and amongst the Southern stars of perpetual apparition."

On the 25th of July, 1858, the Hobarton records contain the following entries: "A meteor of the size of Canopus at 8^h 30^m, quite white, moving from σ Sagitt. to β Aquar.; and on the 30th a meteor of 10 min. in diameter, at 16^h 30^m, also perfectly white, moved from Sirius to the East horizon."

Capt. Bardua, on his voyage from *Akyab* to *Falmouth* mentions on the 21st of July, 1862, ($\phi = -31^\circ$, $\lambda = 2^h$ E) at 16^h, an exceedingly bright meteor moving from SW 20° high to SSW near the horizon. He also saw several small meteors between the 22^d and 25th.

The preliminary discussions on meteors, observed at Melbourne, having proved the time from the 26th to the 31st of July to be a fertile period in frequency of meteors, I was most anxious to observe this phenomenon once more before leaving the Southern hemisphere, and on the 27th of July in 1864 ($\phi = -41^\circ.7$, $\lambda = 2^h 12^m$ W) I was fortunate enough to be able to make some observations which quite corroborate the results previously arrived at. A few of the particulars of these observations may be inserted here. At 7^h a large meteor was seen, but on account of the clouds it could not be exactly traced to the point where it disappeared, near to Saturn. At 8^h 20^m, I saw a meteor of the 4th mag. below the Southern Cross; another one at 8^h 30^m, also of the 4th mag., disappeared near to ϑ Argus, and came from a point ($\delta = -76^\circ$, $\alpha = 11^h 40^m$). Nearly simultaneously with this, another of 2^d mag. moved from a point below β and γ Crucis, its course being parallel to the connecting line between these two stars. At that time the sky became cloudy, but between 9^h 20^m, and 9^h 40^m, 11 meteors were seen, all of which came from a point near the zenith and moved in all directions to the horizon. At 9^h 30^m, at an interval of 2 minutes, two were observed to dart from Corona Austr. through Scorp., and disappeared near δ Lupi. Between 10^h and 11^h, four observers saw 30 small meteors, moving in directions apparently conformable to that above indicated. The 28th was very unfavourable, so that no observations could be made; but on the 29th, at 7^h 15^m, a very large meteor was seen, appearing in NE 45° high, and disappearing in S by W 30° high ($\phi = -37^\circ.5$, $\lambda = 2^h 1^m$ W).

Sir James Clarke Ross, in the account of his expedition to the South Pole, makes the following remark, bearing on this subject: "1840, July the 28th—29th. The gale continued all night, with a heavy cross sea: there was much lightning to the Eastward; *meteors in great numbers* were seen darting about in all directions, and the whole aspect of the sky proclaimed a convulsion or disturbance of the atmosphere of an unusual character." This was in ($\phi = -47^\circ$, $\lambda = 6^h 28^m$ E).

10) The mean hourly number of meteors for August is 2.7. The discussions up to the end of April, 1861, characterize the period between the 13th and 18th as a maximum in the frequency of meteors, the hourly number reaching the high value of 7.8, but it was derived from too few observations to deserve great confidence, at least as far as regards the whole of that period, for we shall presently see that there is strong evidence to cause us to consider the 18th and 19th of August as being particularly fertile.

Of cases of special interest the following may be mentioned:

Capt. Bardua, on his voyage from *Akyab* to *Falmouth* on the 3^d of August, 1862, at 15^h, ($\phi = -34^\circ$, $\lambda = 1^h 28^m$ E) saw several very bright meteors, one of them in WSW 55° high, moving to W 30° high.

Mr. Abbott of Hobarton saw a very bright meteor on the 5th, 1858, at 11^h 20^m, moving from δ Aquil. to α Erid. This gentleman adds, in his meteorological register for 1857, a remark

fully bearing out the conclusions arrived at from the Melbourne observations respecting the Laurentius Period. He says: "August the 9th and 11th has been considered an especially fertile period for shooting stars; a special look-out was therefore kept on those nights, without witnessing any apparent influx, or any assignable point of divergence."

Mr. Brough Smyth mentions, in his meteorological report for 1855, a very bright meteor as having been seen at Melbourne on the 7th of August. It appeared near the zenith and disappeared in SW 30° high.

On my voyage home per "*Garrawalt*" in the year 1864, the evenings from the 7th to the 22^d of August were very favourable for making observations on meteors; and as I was almost continually out on deck, making observations on the comet then visible, I had an opportunity of checking the conclusions previously arrived at with respect to this part of the year, though exact determinations of the flight of meteors could hardly be effected, as I was too much engaged in observing the comet. On the evening of the 7th, I find the following entry in my log: " $(\phi = -10^{\circ} 25', \lambda = 2^h 16^m W)$ saw several meteors"; on the 8th: "sky overcast and rainy"; on the 9th: "none seen"; on the 10th: " $(\phi = -2^{\circ} 55', \lambda = 2^h 8^m W)$ during the whole evening a good look-out was kept for shooting stars, and a number of very large ones were seen in both hemispheres, in spite of bright moonlight"; on the 11th: " $(\phi = 0, \lambda = 2^h 12^m W)$ several very fine large meteors, all of them left long streaks after them."

Dr. Storey, of Swansea, Tasmania, ($\phi = -42^{\circ} 3', \lambda = 9^h 53^m E$) describes a very interesting meteor as having occurred on the evening of the 15th of August in 1863. It was seen in SE about 40° above the horizon, taking a Southerly direction and descending at an angle of 25°. Its size, when first observed, was about that of Venus; after travelling 15°, it suddenly expanded into a yellow mass about the size of the moon, then gradually contracted to its former size, again expanded to about half the size of the moon, and shortly afterwards disappeared with a flash. (Mr. Abbott's Reports.)

With reference to the remark respecting the occurrence of meteors on the 18th and 19th, the following additional observations may prove very valuable:

Mr. Abbott gives the following account of some observations made on the 18th and 19th of August, 1857: "6^h 45^m, a bright meteor from Argo Navis to the South Pole, motion slow, visible 3 seconds; 8^h 22^m, a long bright trained meteor from Aquila to Boötes, visible 3 seconds. 8^h 47^m, a long bright trained meteor from Ras-Alhagas to Vindematrix; at 9^h 10^m, a rapidly moving meteor from Achernar to the South Pole, and one minute after a bright meteor from Ara to Crux. On the 19th, at 9^h 3^m, a rapid meteor from Crux to the South Pole, visible one second; and two seconds after another rapid meteor from Triang. through the Via Lactea to γ Cent."

With respect to the latter date, the following entry in my log on board the "*Garrawalt*" ought to be of interest: "19th of August 1864 ($\phi = +13^{\circ}, \lambda = 2^h W$) at 8^h 30^m saw two fine meteors from some point near to α Corona, the one moving towards the West part of the horizon, the other at right angles to this course, also towards the horizon; both were of 1st mag., red colour, and left a well marked track behind, rate of travelling the same in both cases."

11) The mean hourly number of meteors for September seems to be 2.5; and it would appear from previous discussions, that from the 1st to the 4th they are numerous; but there is too little information at our command, to arrive at a final conclusion respecting this epoch.

Mr. Abbott remarks: "2^d of September 1857, 16^h 30^m, a meteor of 2^d mag. which moved from Rigel to α Lep.; on the 2^d 1858, 7^h 50^m, one 1st mag., pearl white, train 2° 30' from σ Sagit. to π Scorp; on the 2^d 1858, 16^h 10^m, like Jupiter, white, train 3° from β Can. mai. to γ Erid.; on the 4th 1858, 16^h 20^m, 1st mag., violet, with faint train of the same colour, 4° 30' long, from β Columba to Procyon."

The log of the "*Cesar und Helene*," on her voyage from Europe to Australia in 1859, contains the following entry: ($\phi = -18^\circ$ to -21° , $\lambda = 2^h 8^m W$) on the 17th and 18th of September many shooting stars were seen; and Mr. Abbott observed on the 18th, 17^h 15^m, a very large meteor of 15 min. diameter, red, with a short train, lasted 4 seconds, and moved from the Hyades to NE horizon. On the evening of the 19th, in 1855, a very large meteor nearly of the size of the moon was seen by Mr. Surveyor Beyerley at Geelong ($\phi = -38.2$, $\lambda = 9^h 37^m E$).

12) The mean hourly number of meteors for October is 2.9, there being no period characterized by a very large number of meteors during this month. Special mention may be made of the following cases, in addition to the information included in the discussion.

Mr. Todd, of Adelaide, remarks that on the 11th of Oct., 1862, at 8^h 40^m, at Clare, a brilliant meteor was seen in the East, bursting suddenly like a rocket, leaving no trail behind.

Mr. Bolton saw in Hobson's Bay on the 19th of Oct., 1863, at 11^h 20^m, a very large meteor, lasting 10 seconds, and moving slowly from NE 30° high to W 70° high. On the same evening several more large meteors were seen.

Mr. Abbott observed on the 28th, in 1857, at 8^h 40^m, a small meteor of 3^d mag., with a train of 10° length, moving from α Retic. to β Pav.; and on the same day, in 1858, at 10^h 30^m, another one like Mars in size and colour, moving from β Capr. to the NW horizon.

13) It is particularly interesting, with regard to the month of November, to become acquainted with all evidence as to the observation in the Southern hemisphere of any great shower of meteors during the fertile period for localities North of the Line, from the 13th to the 15th, and I shall therefore subjoin hereafter whatever came under my notice respecting this phenomenon. There is no doubt, that during the time the Observatory continued its observations on meteors, the weather was very often unfavourable; the same was the case at Hobarton, for we find in Mr. Abbott's register the following note: "November the 12th to the 17th, 1858. This is now the fourth year of blank return against the November period; indeed no particular period or point of divergence has as yet been observed in the Southern hemisphere."

My own diary, kept on my journeys in connexion with the Magnetic Survey, contains the subjoined notes:

"November the 13th 1860, on the banks of the Murray, close to *Mournpall* ($\phi = -34^\circ.7$, $\lambda = 9^h 29^m E$). Splendid evening, zodiacallight beautifully developed, and although several hours were generally employed during the evening in looking out for shooting stars, nothing was seen."

"November the 13th 1860. Astronomical observations until a very late hour, but no meteors."

"November the 15th 1860. From 13^h 45^m to 15^h, kept a sharp look-out for meteors, but only four were seen, viz., at 14^h 30^m, in S 35° E 40° high, and disappearing in S 25° E 11° high, 1st mag. and white, moving rather slowly, lasting 4 seconds; at 14^h 32^m, from S 70° E 60° high to S 65° E 25° high, 1st mag., moving very slowly, but was quite as brilliant as the other;

at 14^h 45^m, another moving parallel with the first one; at 15^h, another meteor certainly conformable with the former."

"November the 10th to the 18th 1861, at the Junction of the Darling and the Murray ($\phi = -34^{\circ}1$, $\lambda = 9^h 28^m$ E). Moonlight, continually out making observations during the night, and saw but two large meteors, viz., on the 14th, at 7^h 50^m, very large, with a perfectly horizontal course from E to W, close to Achernar; and on the 16th, at 11^h 20^m, one moving from NE by N perpendicularly down to the horizon."

"November the 13th 1862, at *Buenboar*, 2743 feet above the sea ($\phi = -36^{\circ}6$, $\lambda = 9^h 52^m$ E). My astronomical observations extended until after 9^h, so that I had a first-rate opportunity of watching the appearance of meteors, but saw not a single one."

"November the 15th 1862, same locality. At 7^h 56^m saw a very bright meteor which disappeared between α and β Cent., course at right angles to the connecting line of both stars at 8^h 45^m another bright meteor in Taurus, from E to N 15° E, moving horizontal."

"November the 16th 1862, *Grogan's Station* on the *Indi River*, 1615 feet above the sea, ($\phi = -36^{\circ}4$, $\lambda = 9^h 53^m$ E). Looked out for shooting stars in the course of the evening, but saw only one, at 8^h 50^m, disappearing in the N about 5° above the horizon."

Mr. Jhn. Bolton saw in November, 1863, during 8 hours of observation, 23 meteors; some of them referring to the great November epoch may find a place here:

"On the 12th at 11^h 55^m, a very large one from NW 20° high to South 8° high; at 10^h 55^m, very large, from SE 40° high to South 20° high; at 9^h 50^m, from E 75° high to S 45° high, magnitude 1st to 2^d; on the 15th at 10^h 50^m, from NE 35° high to N 15° high, mag. 1st to 2^d; and another of the same mag. at 11^h 55^m, from N 50° to NW 20° high."

Capt. Meyer of the "*Cesar und Helene*" reports to have seen on the 13th, at 16^h, 1859, ($\phi = -40^{\circ}$, $\lambda = 8^h 8^m$ E) a number of meteors flying to the W.*

Mr. C. Maplestone sighted at *Tarnagulla* ($\phi = -36^{\circ}7$, $\lambda = 9^h 35^m$ E) on the 19th Nov., 1863, a meteor, of which he gives the following very interesting description: "I saw at, 10^h 14^m (Melb. mean time) a meteor of a red colour, and rather brighter than Mars at opposition, appeared near the horizon, as near as I could conjecture due SW, and passed over this place within 2 or 3 degrees of the zenith, and to the NW of it, and finally disappeared, from the effect of its distance (not apparent extinction) in the NE and within a few degrees of the horizon. It threw out a trail of sparks which appeared to be 5° in length."

I find the following entry in my diary of 1862: "November the 26th, at 8^h 9^m, near *Cabungra* ($\phi = -37^{\circ}1$, $\lambda = 9^h 50^m$ E). A magnificent meteor; it was about 16° towards the North of the moon and about 20° above the horizon when it disappeared, its course was from the North and made an angle of 38° with the horizon, it cast a strong bluish light notwithstanding the moonlight, and seemed to discontinue in its course for some time, and then took a fresh start; when it disappeared, sparks flew from it, but no sound was heard."

On my voyage from Europe to Australia in 1856, on board the "*La Rochelle*" ($\phi = +3^{\circ}$, $\lambda = 1^h 52^m$ W) I saw on the 30th, at 14^h, several large shooting stars from the zenith moving towards the horizon; and *Mr. Abbott* saw on the 30th November, 1857, at 8^h 45^m, a meteor of

* It is much to be regretted that the great November phenomenon of last year (1866) could not be observed at Melbourne, the weather having been at the time too unfavourable, — a piece of intelligence which I received by the last mail.

twice the size of Jupiter, of bluish colour, lasting from 10 to 12 seconds, moving from SW to NW. "This remarkable meteor appeared like an electric light, which dimmed the light of the full moon and Jupiter, both of which were shining at the time in clear blue sky; the meteor disappeared in sparks."

14) The number of meteors increases towards the month of December, the mean hourly number being 2·8; between the 11th and 13th, however, 4·5; and between the 23^d and 25th, even 5·2. A few interesting cases may find mention here:

In 1856 on the 15th, at 8^h, I saw ($\phi = -34^\circ$, $\lambda = 1^h 28^m$ W) a very large meteor moving in the vertical of WNW. I was then en route to Melbourne.

Mr. Bolton observed 33 meteors in 1863 during this month: on the 6th, 5; on the 9th, 6; on the 12th, 2; on the 18th, 2; on the 21st, 6; and on the 27th, a very large one, at 8^h 50^m, of a slow motion, nearly horizontal.

Mr. Surveyor Dawson gives the following description of a meteor seen at Sale ($\phi = -38^\circ 1'$, $\lambda = 9^h 48^m$ E) on the 22^d of December, 1855: "There was visible here about 10^h, a most extraordinary luminous meteor. It appeared first in the NE part of the heavens, and traversed an arc of 90 or 100 degrees in a South-westerly direction. It was accompanied by a loud report, resembling a piece of ordnance, which appears to have been loudest to the Westward, and to have died away towards the East". . . . (Mr. Smyth's report).

Mr. Abbott gives the following account of a similar meteor: "One of these aerolites of a remarkable kind was seen in our sky on the 26th of December last (1856) at 8^h 50^m; it appeared in the NW part of the heavens, about 15° above the horizon, and was 4 or 5 min. in diameter. It travelled slowly in the direction SSW, keeping about the same altitude; it was seen for about one minute, and but for the strong twilight at the time, it would probably have left visible a strongly marked train." On the 30th of December in 1857, at 10^h 30^m, was seen at Hobarton a large meteor of the size of Jupiter, white, and moving from Achernar to β Pisc. Aust.

15) The monthly mean values of the hourly number of meteors, as given in these remarks, differ slightly from those values obtained by taking the mean of three daily periods (R. II. pag. 138, § 108). The latter have been used in constructing the curve of frequency of meteors on table 49, Fig. 2, and they may find a place here in juxtaposition with the corresponding values as given in Humboldt's "Cosmos" for the Northern hemisphere.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Southern Hemisphere	2·2	1·8	1·6	1·4	2·0	3·0	3·2	3·2	2·8	3·0	2·2	2·9
Northern Hemisphere	3·4	—	4·9	2·4	3·9	5·3	4·5	5·3	4·7	4·5	5·3	4·0

16) On the relative frequency of the various magnitudes of shooting stars, see R. II. pag. 139.

17.) From the results of this paragraph we glean that one of the radiant points, ascertained by the preliminary discussion, and based on but 547 single observations, exactly coincides with the group H; another falls within the group Δ and close to Δ_2 , whilst the radiant near the pole of the ecliptic, as determined by the preliminary discussion, seems not to be borne out by the subsequent determination, based upon four times as large a number of observations. Of the secondary points of divergence determined by myself, there seems to be only one confirmed by a more rigorous examination, viz. $\alpha = 300^\circ$ (20^h), $\delta = -30^\circ$, it being close to the radiant Y_2 .

18) Mr. *Alexander S. Herschel* communicated to me the following interesting remarks:
 "Collingwood, Hawkhurst, Kent. On the evening of the 28th of July last (1865), a period noticed in your work as second to only one other period in the year for the frequency of meteors at Melbourne, I observed at this place several bright meteors traversing the sky in long tracks, having their radiant point at Fomalhaut, within a few degrees of our horizon. This distinctness of the radiant point on this occasion, made it appear probable that in latitudes where *Fomalhaut* culminated very nearly in the zenith, a considerable shower of meteors must have taken place. Referring to your list of remarkable points of radiation (R. II. p. 140), I find a point in $\alpha = 20^h$ and $\delta = -30^\circ$ (Fomalhaut and Sagittarius) described as 'a position of the highest interest and deserving of particular attention with the view of determining further points of radiation.' " According to the investigations of Professor Heis, the conformable meteors, during the period alluded to by Mr. Herschel, radiate from point 7 in Phoenix and not from point 11 in Piscis Austr. (p. 133), as we should be led to suppose by the above communication. It is the radiant point for September which is near Fomalhaut, and it is now interesting to know, whether the observations of Mr. Herschel, above referred to, form an exception, or whether really during the period of the 28th and 29th of July some meteors radiate from the point in Piscis Austr.

19) If we draw the parallel of declination of the zenith at Melbourne ($-37^\circ.8$) on our chart, we observe that the centres of most of the groups of radiant points are situated on or near that line, H and Φ lean against it, while O and Σ are on the ecliptic, Ξ and Ψ are on the equator, and P is near the South Pole.

END OF PART I.

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PART II.

TERRESTRIAL MAGNETISM.

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TERRESTRIAL MAGNETISM.

I. INTRODUCTION.

1. ON several occasions I have already described the great difficulties encountered in the course of the erection of the Magnetic Observatory. I have also pointed out how much it was to be regretted that our labours on Terrestrial Magnetism were not made from the first at the spot where the Observatory now stands; the exceeding difficulty of keeping the instruments constantly in check, caused by the incessant building alterations in the neighbourhood of the Observatory, involving a great waste of time and energy. The results of this discussion will show that we have surmounted the various obstacles in our way; and I may also be permitted to say that we have good reason to congratulate ourselves thereupon. Only those who have had to contend with similar difficulties will know how to appreciate the achievements of the Flagstaff Observatory.

In order to be able fully to understand all the circumstances connected with the erection, working, and subsequent removal of the Observatory, I refer those interested in this matter to the following passages in my previous publications: viz., Preface to "R. I.," pp. iii. and iv., Preface to "R. II.," p. iv.

The results of the inquiry as to the most suitable spot for a Magnetic Observatory in the neighbourhood of Melbourne, will form part of the publications on the Magnetic Survey of the Colony of Victoria. For the present, it may suffice to mention that there exist considerable differences in the values of the three magnetic elements in the former and present sites of the Observatory, which differences I shall take an opportunity of pointing out when speaking of the absolute measurements. These differences are of such a nature that we cannot but attribute them mainly to differences in the geological formation of the two localities. The Flagstaff Hill, on which the Observatory formerly stood, and where the greater part of the observations have been carried out, consists of decomposed basalt, covered to a depth of from 10 to 20 feet with Tertiary gravel. To the West of it there are large masses of older volcanic rocks, exerting a great influence upon the various magnetic elements, clearly illustrated by their gradual change on proceeding Westwards from the Observatory. The "Melbourne Observatory," on the other hand, is erected on a hill of Silurian formation, covered with cappings of Tertiary deposits; and the fact that the values of the magnetic elements remain constant on proceeding towards the East, or at least show only such changes as are fully accounted for by the change in geographical position, is calculated to support the assertion that the magnetic observations made at the New Observatory are not influenced by any local effects within a measurable degree, according to our present knowledge on this point.

As I have already mentioned, in addition to the influence exerted by the geological formation on the values of the magnetic elements, as determined at the Flagstaff Observatory, there were others caused by buildings and building alterations, which seriously interfered with my labours on Terrestrial Magnetism. S. 40° W of the little house, in which all absolute determinations were made, and only 104 yards distant from it, stood an iron house, which exerted *some* (however trifling) influence, as was subsequently proved on its removal. This took place on the 7th—10th of February, 1859, and caused the magnets in the Horary House, at the same distance from it, to oscillate slightly. Another source of great annoyance arose in the month of October, 1859, when alterations in the cutting of King Street made it exceedingly difficult to continue magnetic registration. The blasting going on in connexion with these labours, during the time from the 19th of October to the end of that month, set the magnets in continual motion; so much so, as to render an exact registration of the instruments utterly impossible. On my representations the Government interfered on behalf of the Observatory, and the blasting operations were stopped, though not without having previously done some permanent injury to the pillars upon which the differential instruments were mounted. This manifested itself, especially after heavy rains, from the date of the commencement of the alterations in King Street, to the end of the working of the Flagstaff Observatory — being most observable in January, February, July, and August, 1862 — thus causing blanks in the records, which I shall have to point out when treating of the results of the observations on the various elements. These latter alterations affected more directly the readings of the differential instruments in the Horary House. But others, as, for instance, the erection and working of a saw-mill on the 22nd of June, and another on the 13th of November, of the same year, could not fail to influence the absolute determination of the elements, thus causing the Observatory to become quite untenable. But it was not until the 21st of September, 1862, three years after the commencement of these grievances, and but five months prior to the end of the period over which the observations forming the subject of these discussions, extend, that a new era began, and systematic registrations on Terrestrial Magnetism were taken up at the New Observatory a locality perfectly unobjectionable in every respect, and already recognised by me as such early in 1857, after a mature examination of the results of my respective observations on different localities.

It was indispensable for the full appreciation of the subsequent discussions and observations, to make some mention of the difficulties under which the Magnetic Observatory laboured, as it is evident that they must have impaired to some extent the efficacy of its working.

2. There cannot exist any occasion for entering upon a full description of the various buildings forming part of the Observatory, as such description has already been given at various times and in various publications ("R. I.," Introduction, pp. 215—217, and "Transactions of the Philosophical Society of Victoria," Vol. III., 1858, pp. 94—97). It would be equally superfluous to give a full account of all the instruments used in making the observations, as they have been fully enumerated in "R. I.," pp. 216, 217; and are, by Professor Lamont's writings, well known to every one conversant with the subject of Terrestrial Magnetism. The same remark applies with respect to the mode of reducing the observations; the more so, as a detailed account of it has already been printed in my first publication on Terrestrial Magnetism ("R. I.," pp. 218, 236, 241, and 244).

With respect to the instruments used for the hourly observations, I have yet to add a few words. Up to the month of June, 1861, the same instruments were used, though since the 20th of October, 1860, new scales had been employed; but as there seemed to be good

reason to suspect the presence of metallic iron in the cases of the instruments, an extensive series of observations was undertaken with the sole object of determining the amount of the influence such iron exerted, if it exerted any whatever. The respective observations were made on the 30th of May, 1861. The result was, that there did not exist any perceptible influence caused by iron in the metal of which the cases were made; and consequently, as far as that was concerned, the instruments might have been retained. But as it had become necessary to have some other repairs done to them, new instruments were put in their places, and the registration recommenced on the 5th of June, 1861. Observations on the absolute values of the magnetic elements, up to the commencement of 1861 usually made in the Absolute House, had become useless for reasons above described, and it was therefore thought advisable to mount the old set of differential instruments in this house, which was accordingly fitted up for that purpose. In September, 1861, a series of *day* observations was commenced, and continued until the 21st of September, 1862, when systematic registrations on Terrestrial Magnetism were taken up at the New Observatory. But during the last two months of that period (July and August, 1862) the instruments hitherto in the Horary House (new set) had to be removed, and were placed in the New Observatory, in order to enable me to continue for some time simultaneous readings in both places, with the object of comparing the respective results. During the months of July and August and to the 21st of September, 1862, the observations printed hereafter and included in the discussions, were made in the Absolute House, and with the aid of the old set of instruments.

TEMPERATURE IN THE HORARY HOUSE.

3. The influence of changes in temperature on the observations on horizontal force and inclination, so seriously interfering with their value, was sought to be reduced to a minimum by every available means. For, although it is well known that in observing the horizontal force deflecting magnets, compensated for temperature, are made use of in Professor Lamont's instruments, it was not considered safe to trust too much to the efficacy of this arrangement, especially not for a great range and a high degree of temperature. Guided by these considerations, the construction of the Horary House was adapted for being sunk in the ground, double walls and doors and a double skylight keeping out any sudden change in temperature of air. With regard to the skylight, the precaution was used of drawing a curtain over it during the daytime; and the light of the lamp used in illuminating the scales at night was screwed down quite low, and only lit up during the registrations. The instruments themselves were again put under glass covers, leaving merely a square opening for the reading of the scales, thus preventing any sudden current of air from affecting the temperature of the magnets. Notwithstanding all these precautions, I considered it of the utmost importance to record the temperature within the Horary House, together with the magnetic instruments. The thermometer was for this purpose enclosed within a glass tube, and suspended close to the walls of the building, thereby causing it to be as nearly as possible under the same conditions as the magnets with respect to temperature and sudden changes therein. The following five tables contain the monthly mean temperatures for every hour and the single years of observation; another table shows the same values, the five years being thrown into one.

On examining these tables somewhat more closely, we learn that the diurnal fluctuations of the temperature within the Horary House are considerably reduced with respect to their amount, when compared with those of the temperature in the open air. The amplitude of the temperature in the Horary House is, for the summer season 45 per cent., for the winter 35 per cent., and for the equinoctial quarters 39 per cent., of the amplitude of temperature of air, thus showing a considerable reduction; but in order fully to appreciate the efficacy of the construction adopted, it must be borne in mind that the above percentages apply only to average values: and that, in reality, for single days of a great range in temperature, those percentages have been still more considerably reduced. We find, for instance, on the 14th of January, 1862, a range in temperature of air amounting to $41^{\circ}5$; while that in the Horary House for the same day was but $16^{\circ}3$, which would make the latter only 39 per cent. of the former, 45 per cent. being the average for the summer season. The maximum temperature takes place in the Observatory, for hourly registrations at about 3^h 15^m p.m., and the minimum at 7^h 30^m a.m., taking an average for the whole year. From this we perceive that there exist considerable differences in the turning-points in the daily oscillations in the temperature of the air and of that in the house referred to, whereby is adduced an additional proof of its isolating qualities with regard to temperature. The mean temperature for the year in the Horary House is $59^{\circ}38$, being $1^{\circ}55$ higher than that of the air. This excess is greatest in the winter season, being then about $2^{\circ}0$, and diminishes to $0^{\circ}8$ only during December and January.

The Horary House in the New Observatory was constructed on a somewhat different plan to that of the Flagstaff Observatory. In the latter, the water gathering round the pillars, whereon the instruments stood, interfered most seriously with the observations; so much so that, when called upon to make a plan of the buildings forming the present Magnetic Observatory, my principal care was directed to the avoidance of this great drawback of the underground arrangement; and accordingly it was determined to erect the new Horary House on a level with the ground, and to form an artificial mound round its walls, which would serve the same purpose of preventing the sudden communication of the temperature of the air to that in the interior of the building. The above tables show clearly that no material change took place in the New Observatory with respect to the state of the temperature within, inasmuch as the ranges in temperature and its mean values appear to have been unaltered, when compared with those observed at the Flagstaff Observatory.

II. MAGNETIC DECLINATION.

HOURLY OBSERVATIONS.

4. PRIOR to entering on a discussion of the observations on the hourly motion in the Magnetic Declination, we subjoin here the complete series of observations for nearly five years, during which time the Observatory continued systematic registration. The arrangements for the reception of the instruments were not yet completed at the time when the observations on meteorology were taken up, viz. the 1st of March, 1858; and it was therefore necessary to defer the opening of our labours in that branch of physical science to the 1st of May of that year.

FLAGSTAFF OBSERVATORY.

9

MAGNETIC DECLINATION DURING THE MONTH OF MAY 1858.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	43.8	43.8	44.0	43.9	43.1	43.0	43.0	42.6	41.3	40.9	41.8	43.0	45.8	47.8	47.3	47.0	45.9	45.0	45.2	45.5	43.0	43.9	43.6	43.9
2d	43.0	42.0	42.2	42.1	41.5	40.0	41.3	42.0	42.1	41.3	41.0	42.0	44.1	46.2	43.0	45.7	46.6	45.5	44.8	44.0	44.0	43.8	43.2	43.5
3d	43.5	43.7	43.8	43.6	43.9	43.0	43.0	42.6	42.2	40.9	40.9	41.9	43.9	46.8	47.9	47.2	46.3	45.8	45.0	44.3	44.0	44.0	43.5	43.6
4th	43.5	43.8	43.8	43.5	43.8	43.3	42.5	42.3	40.9	39.6	40.1	42.2	46.0	47.7	48.8	48.3	48.0	46.0	45.0	44.0	44.1	43.8	43.7	43.8
5th	43.4	43.3	45.0	43.9	43.8	44.0	43.1	—	42.0	40.0	40.9	42.0	44.9	47.0	48.0	47.8	46.9	45.3	43.8	44.4	44.1	43.8	43.3	43.5
6th	43.5	43.6	43.9	43.9	43.9	44.0	43.5	43.1	42.2	41.0	40.8	41.9	44.8	47.1	48.9	48.3	46.8	45.9	45.2	45.0	44.3	43.8	43.6	43.5
7th	43.3	43.0	43.6	43.0	44.0	43.8	43.1	42.8	42.0	41.7	42.3	43.1	44.6	46.8	46.9	46.4	46.0	45.0	45.0	44.0	43.5	43.2	43.0	43.0
8th	43.0	43.3	43.1	44.3	44.3	44.0	43.9	41.5	43.8	41.0	42.0	45.2	46.3	52.4	56.7	53.5	50.1	50.0	44.5	44.1	27.3	43.8	43.7	46.8
9th	43.3	44.3	46.0	47.0	44.1	47.1	45.6	44.0	45.0	42.0	43.3	43.3	46.5	45.0	47.7	48.0	49.7	41.7	44.0	44.0	41.0	38.6	38.7	40.7
10th	45.8	43.2	43.5	44.9	45.5	44.9	44.0	43.8	46.9	47.4	43.3	43.2	46.0	45.9	48.5	49.9	43.0	46.0	44.6	39.0	43.5	43.1	42.8	47.0
11th	41.0	43.0	42.5	46.0	46.0	44.1	44.5	43.9	43.0	42.0	40.7	42.0	44.2	47.0	50.0	47.4	47.6	44.9	44.8	44.1	43.0	42.0	43.2	43.6
12th	43.3	44.3	44.0	44.0	44.3	46.1	45.0	45.0	43.1	44.2	41.0	42.4	44.9	47.6	49.0	48.0	46.0	45.0	44.0	43.3	41.7	42.3	43.7	43.5
13th	44.0	43.9	45.0	44.4	44.0	44.0	44.5	45.1	44.3	41.2	40.8	42.8	45.5	47.8	47.6	47.3	46.7	44.9	43.9	44.2	43.3	43.8	43.8	42.5
14th	43.0	43.9	45.0	45.0	44.5	43.5	46.0	43.1	43.3	41.3	43.3	42.9	46.0	48.0	48.6	48.8	46.5	44.8	44.0	43.9	43.2	43.9	42.8	43.1
15th	43.0	46.4	45.0	45.1	45.0	44.1	43.5	44.0	43.2	41.6	41.2	42.3	44.1	46.8	48.1	48.2	47.5	46.0	45.0	44.0	44.0	44.0	43.9	43.9
16th	43.9	44.4	44.8	44.8	44.5	—	43.9	43.3	42.9	42.4	42.6	43.0	44.9	47.0	47.4	47.0	46.0	45.6	45.0	44.1	43.9	43.9	43.9	43.9
17th	44.0	44.3	44.0	44.2	44.4	44.6	44.0	44.0	44.0	43.3	44.8	46.2	47.0	48.0	49.0	49.6	49.1	47.0	45.5	44.7	44.0	43.9	40.3	42.7
18th	42.5	41.2	44.0	46.9	43.0	42.2	47.0	41.0	42.9	41.9	41.0	43.1	45.0	47.1	48.6	48.7	47.0	44.3	45.8	44.0	44.3	44.0	43.5	43.2
19th	43.1	44.0	44.0	45.0	45.5	44.0	—	43.9	43.1	41.8	41.7	42.2	42.9	44.6	47.0	48.5	47.2	45.3	44.9	44.2	44.2	44.0	44.0	43.6
20th	43.8	44.1	44.5	44.3	44.5	43.9	43.3	44.0	44.2	42.0	41.8	42.1	43.5	45.6	46.2	47.0	46.2	45.0	44.8	44.5	44.0	44.0	43.9	43.9
21st	44.0	44.4	44.4	43.8	44.8	45.0	44.7	45.0	43.2	42.0	40.9	42.0	44.0	47.0	48.2	49.1	46.2	45.9	45.0	44.8	44.2	43.8	43.5	43.2
22d	44.0	43.9	43.9	43.9	43.9	43.9	43.9	44.0	43.8	42.4	40.9	41.3	41.2	46.1	48.1	52.7	50.0	46.6	45.9	45.8	49.7	45.8	44.6	44.7
23d	44.0	43.0	44.0	45.1	45.0	44.2	44.0	44.0	41.4	43.1	42.4	42.4	45.0	46.9	47.9	48.0	47.1	47.0	47.0	47.2	46.8	44.5	43.7	44.5
24th	44.2	46.6	44.1	43.9	42.9	43.4	45.0	49.5	46.9	45.7	44.0	45.9	48.3	53.7	51.0	50.0	48.0	34.0	41.6	44.4	47.2	40.0	40.9	40.0
25th	38.9	38.4	42.9	44.2	45.8	44.0	44.9	44.6	44.3	43.4	43.0	43.8	45.1	46.9	48.0	47.7	46.7	45.6	45.0	44.8	45.0	44.8	42.8	43.1
26th	43.1	43.0	44.0	44.5	44.2	45.0	43.9	45.0	43.3	43.0	42.0	43.0	43.5	47.1	47.5	48.0	48.6	46.6	46.9	45.9	44.7	44.3	41.3	41.8
27th	44.0	44.0	44.6	45.0	45.0	45.0	45.0	45.0	43.9	43.0	42.8	42.9	44.1	46.0	47.9	48.3	47.4	45.8	45.7	45.0	46.2	45.9	43.5	43.0
28th	43.0	43.1	43.8	44.5	45.2	44.9	44.6	43.9	45.0	46.0	42.9	42.6	44.0	46.4	48.0	49.2	47.4	45.0	44.0	46.0	45.0	44.5	44.4	45.0
29th	44.3	44.1	43.5	46.4	45.0	44.4	45.1	44.5	45.6	45.2	45.2	46.0	47.0	47.8	48.5	47.9	47.1	46.2	46.0	44.3	46.8	45.9	44.4	43.1
30th	44.0	44.4	43.9	45.3	46.0	45.4	45.1	45.0	44.9	44.0	44.0	45.0	46.1	46.8	47.2	49.1	48.1	46.1	43.6	45.8	45.8	45.2	44.8	42.0
31st	41.2	43.3	45.0	45.0	45.0	45.0	45.0	45.0	44.9	44.6	45.9	46.0	45.9	45.4	48.8	49.0	49.0	49.0	47.0	45.1	45.1	44.9	44.5	43.5
Means	43.37	43.60	44.06	44.56	45.69	44.14	44.20	44.24	43.54	42.58	42.24	43.15	45.01	47.17	48.27	48.44	47.25	45.38	44.92	44.49	43.91	43.78	43.25	43.45
Normals	43.52	43.94	44.06	44.56	45.69	44.14	44.20	44.07	43.54	42.42	42.24	43.15	45.01	46.77	48.16	48.27	47.25	45.61	44.92	44.68	44.28	43.95	43.40	43.45

MAGNETIC DECLINATION DURING THE MONTH OF JUNE 1858.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	43.5	42.9	41.0	46.5	44.5	46.7	45.4	45.7	45.8	44.5	44.1	44.3	44.3	46.3	49.0	48.1	48.0	47.0	46.0	45.8	45.1	45.0	45.0	44.1
2d	44.9	45.0	44.5	45.0	45.6	45.8	45.2	45.1	46.6	45.4	44.7	44.5	45.0	46.9	48.9	49.0	47.2	46.0	45.1	45.0	45.6	45.5	44.8	43.0
3d	44.9	46.1	46.5	48.0	48.0	46.0	46.0	46.0	45.9	44.9	43.8	43.8	44.1	45.4	46.0	48.0	48.0	46.1	46.0	45.0	43.6	45.2	45.0	45.3
4th	45.0	46.8	46.0	46.0	46.5	47.0	46.0	46.0	45.8	45.0	44.4	46.1	50.8	47.1	48.9	49.3	51.9	46.0	47.0	46.5	42.5	36.1	42.7	41.5
5th	43.0	39.0	49.0	46.4	47.9	47.1	49.0	49.5	51.1	49.4	44.6	45.4	45.8	48.3	50.0	50.9	44.2	45.2	44.8	45.0	45.0	43.5	43.0	45.0
6th	44.7	46.0	45.2	43.2	50.7	46.4	47.9	48.0	47.0	45.3	45.0	45.0	48.0	46.5	47.7	47.4	50.4	45.0	42.5	41.9	—	43.6	44.3	43.6
7th	44.5	45.7	46.0	49.5	46.2	47.0	46.5	49.0	50.3	46.6	45.9	44.8	47.9	47.2	47.9	50.0	46.6	45.0	41.9	45.0	42.6	43.0	45.1	45.5
8th	39.0	41.5	46.0	46.0	47.0	47.5	47.1	47.9	48.6	55.5	47.8	43.4	46.0	47.0	47.5	46.4	47.1	44.3	46.0	40.0	45.3	42.2	44.2	44.9
9th	40.0	45.6	45.1	47.8	47.6	45.6	45.1	46.0	45.8	43.6	43.0	44.2	44.6	—	47.9	47.0	47.0	46.0	43.5	45.0	45.2	43.0	45.0	45.2
10th	45.3	46.0	46.3	48.9	45.1	46.0	46.4	46.0	45.1	44.0	42.9	42.9	46.0	48.0	48.4	48.3	47.3	44.8	44.1	45.4	45.3	44.8	44.3	44.2
11th	45.0	45.7	46.0	46.0	46.0	45.5	45.6	46.0	46.1	45.0	44.0	44.3	45.2	47.0	47.4	48.9	47.1	45.7	45.4	45.9	45.9	45.5	45.4	44.9
12th	44.1	46.1	46.4	46.0	46.1	46.0	45.6	46.0	46.2	44.7	43.2	42.2	44.9	46.5	48.0	49.0	48.5	46.0	46.2	46.9	44.0	45.0	44.5	44.5
13th	45.0	45.0	41.7	45.5	—	45.5	46.2	46.0	46.1	45.0	43.7	45.0	47.1	46.4	48.3	50.0	49.1	46.0	46.0	46.9	45.1	42.3	44.0	45.0
14th	45.7	45.3	46.9	45.9	48.2	48.0	47.0	47.1	46.9	46.0	43.9	43.0	43.4	45.5	47.8	49.2	49.0	47.0	46.0	45.7	45.9	45.7	43.1	45.4
15th	46.0	46.0	46.2	47.0	46.9	47.5	47.0	45.9	47.8	47.0	44.8	44.5	45.0	47.2	49.9	49.3	48.4	46.0	46.0	45.9	45.5	45.1	45.1	45.0
16th	45.2	46.0	46.0	47.0	46.5	46.5	46.0	46.0	46.0	45.0	44.4	44.5	45.1	46.1	47.0	48.0	47.9	46.1	46.0	45.5	45.5	44.2	45.0	45.0
17th	45.6	46.1	47.0	47.1	46.8	46.8	46.3	46.5	46.6	45.8	45.0	44.0	45.0	46.1	49.3	51.1	49.0	47.0	47.0	46.4	45.5	44.9	45.0	45.1
18th	45.1	46.5	45.9	47.0	46.0	44.8	47.0	45.0	46.1	45.1	44.3	46.0	46.1	46.7	48.4	48.6	50.0	47.0	49.0	46.0	45.5	45.4	44.8	43.7
19th	45.0	45.1	45.8	45.2	46.0	46.5	45.3	45.8	46.0	45.8	44.9	45.1	46.2	50.1	51.0	54.3	49.8	46.7	46.3	46.3	45.9	44.5	43.1	44.9
20th	44.0	45.6	46.8	45.0	46.2	47.0	45.0	46.0	46.0	44.9	45.7	46.0	47.1	—	46.4	47.7	51.4	50.0	45.6	49.0	33.0	46.0	44.0	45.5
21st	41.7	43.2	44.8	46.6	47.5	46.8	46.3	46.2	47.1	46.5	44.6	42.6	43.9	47.0	48.0	47.3	47.4	47.1	46.0	46.5	47.0	48.5	48.0	43.5
22d	44.5	44.3	44.9	44.7	44.1	45.3	45.9	46.3	47.0	46.5	45.2	44.2	45.0	47.0	49.4	49.7	49.0	46.9	47.0	46.5	46.0	45.9	44.2	45.2
23d	45.0	46.0	45.9	46.9	47.1	47.1	46.7	47.3	49.7	47.0	47.0	45.1	43.9	47.0	49.3	51.9	55.0	57.2	45.9	47.4	42.0	39.0	44.9	45.9
24th	46.0	41.0	43.5	40.1	49.0	45.8	44.0	45.1	51.5	49.3	48.7	50.4	48.5	51.5	55.9	60.0	59.0	49.5	54.0	50.0	45.0	41.0	46.0	44.6
25th	41.0	41.1	39.6	42.1	43.2	43.6	49.8	60.8	56.1	52.8	53.0	49.1	48.0	47.0	49.5	51.3	51.0	37.4	52.0	47.1	44.1	44.1	44.9	44.1
26th	43.9	45.0	46.1	46.0	45.8	45.9	45.8	46.1	47.7	45.0	45.2	44.0	46.0	50.0	50.0	49.2	50.0	44.0	47.3	48.2	47.9	45.7	45.2	44.8
27th	44.9	45.0	46.3	46.5	50.0	48.0	47.5	49.5	48.1	46.2	45.0	—	—	47.3	48.7	49.0	48.4	45.6	48.0	47.8	48.2	46.4	44.9	45.9
28th	44.0	43.9	44.0	46.0	45.4	46.4	47.0	46.7	46.5	44.9	44.3	45.0	45.6	48.4	50.6	51.0	50.1	47.9	47.6	48.6	48.0	46.9	44.9	44.4
29th	45.0	46.1	46.0	46.6	47.0	46.8	47.8	47.5	47.1	45.4	49.8	46.5	49.9	48.3	50.0	51.1	51.0	50.0	48.6	48.1	47.0	46.0	45.9	46.0
30th	46.2	45.9	46.1	46.0	46.5	46.8	46.7	46.9	47.6	47.1	46.1	46.0	47.0	50.0	48.7	50.0	49.9	46.6	46.0	48.9	49.2	40.0	—	42.0
Means	44.36	44.78	45.49	46.02	46.67	46.39	46.43	46.99	47.47	46.31	45.30	44.82	46.01	47.42	48.86	49.70	49.29	46.50	46.43	46.27	45.05	44.11	44.70	44.57
Normals	44.70	44.98	45.69	46.22	46.67	46.39	46.43	46.52	47.47	45.75	44.86	44.70	45.84	47.42	48.62	49.17	48.91	46.45	46.11	46.49	45.48	44.75	44.70	44.57

MAGNETIC DECLINATION DURING THE MONTH OF NOVEMBER 1858.

Value of a part of division 0.802 min.

119	118	117	116	115	114	113	112	111	110	109	108	107	106	105	104	103	102	101	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
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[illegible]

FLAGSTAFF OBSERVATORY.

13

MAGNETIC DECLINATION DURING THE MONTH OF JANUARY 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	45.8	45.8	45.5	46.8	45.7	44.7	43.7	41.8	39.3	35.1	30.6	26.4	50.7	54.9	54.9	55.0	53.8	51.7	49.2	48.8	48.0	47.6	47.1	46.8
2d	45.3	44.9	44.9	44.8	44.8	43.7	41.7	40.7	40.7	42.0	44.0	48.1	50.8	51.6	51.9	50.8	48.9	47.7	47.8	47.4	47.9	47.4	46.8	46.0
3d	45.8	44.9	45.6	45.2	44.7	43.7	42.9	40.8	39.3	38.9	42.0	46.4	51.0	53.0	52.7	51.8	50.0	49.6	49.3	48.9	48.9	48.8	48.8	47.8
4th	48.4	47.6	47.7	46.9	47.1	46.9	46.1	44.6	42.4	39.8	42.5	47.2	53.1	57.0	56.2	51.9	51.3	49.3	48.8	48.2	47.4	46.8	45.9	47.3
5th	47.3	47.8	47.9	48.1	49.8	46.8	45.6	41.6	36.4	33.5	37.9	42.9	50.1	54.1	54.9	(53.2)	(51.4)	(49.7)	47.9	47.1	47.5	47.5	47.2	46.9
6th	45.8	45.6	45.2	45.7	45.1	44.8	43.8	41.0	40.5	39.7	(42.9)	46.1	51.8	(51.8)	51.8	50.1	48.0	46.8	46.8	46.2	46.3	46.2	46.4	46.3
7th	46.0	45.8	45.8	45.0	45.6	45.6	44.0	42.0	38.1	34.6	36.7	(39.5)	42.3	54.0	57.6	58.1	55.9	52.3	49.9	49.0	48.7	48.8	47.8	48.8
8th	48.7	48.5	48.6	48.9	48.5	45.3	47.8	45.1	42.6	41.1	42.8	45.9	52.7	57.8	57.8	55.8	52.6	52.1	50.8	49.9	50.5	50.9	51.8	51.8
9th	51.7	51.9	52.1	51.5	52.1	51.0	49.1	46.8	40.9	38.8	39.0	44.6	50.2	54.3	56.5	56.7	54.7	53.8	53.8	53.8	52.9	54.3	53.7	53.2
10th	53.5	52.9	52.4	53.8	53.3	51.9	49.8	47.9	45.5	41.0	43.6	47.5	52.8	57.1	60.1	61.1	59.8	56.7	54.8	(53.2)	51.6	52.6	49.0	48.7
11th	45.6	42.8	44.9	47.8	48.0	47.3	47.6	44.9	39.2	45.7	46.6	49.9	54.4	56.9	58.8	60.1	59.8	57.8	54.7	53.8	52.8	51.8	47.6	51.7
12th	50.2	49.3	50.5	(50.3)	50.1	51.5	52.1	49.1	45.7	42.1	45.3	45.9	49.4	54.4	57.7	54.4	54.4	53.5	55.1	55.4	54.8	54.5	52.9	53.3
13th	50.4	51.5	53.1	53.1	53.6	52.6	50.9	48.6	45.6	44.6	46.8	50.6	42.9	55.3	57.8	58.5	57.8	56.4	54.0	52.2	50.0	49.8	53.6	53.8
14th	52.5	51.8	51.8	51.8	51.3	50.8	48.9	47.1	43.8	42.8	42.8	44.6	47.8	50.3	53.6	54.9	54.8	53.7	51.6	50.6	50.5	50.6	50.1	49.9
15th	49.8	49.8	49.8	49.9	49.9	49.8	48.8	45.9	42.8	41.2	42.8	45.5	46.8	49.6	50.8	51.5	52.9	50.7	50.0	49.8	46.8	42.8	44.8	43.9
16th	48.6	46.1	38.6	38.0	45.7	50.2	48.9	46.4	45.9	44.9	46.8	50.0	52.8	54.4	53.1	52.3	53.5	51.0	50.8	53.6	53.8	53.0	51.8	53.0
17th	52.8	52.7	52.7	50.8	50.7	47.6	47.8	46.5	46.5	46.0	47.9	50.0	42.9	55.7	55.0	54.6	56.7	54.4	53.5	53.3	54.0	53.8	54.2	52.8
18th	52.8	51.8	51.3	50.8	50.8	50.7	48.9	46.7	46.5	45.5	47.8	49.8	51.0	53.9	51.9	50.6	51.0	50.8	50.3	50.6	45.1	45.7	44.9	44.0
19th	43.3	43.8	44.7	43.5	42.9	43.8	41.5	41.6	39.1	40.8	53.9	49.0	54.2	54.7	54.1	53.7	53.8	53.0	51.9	50.8	49.8	48.6	41.9	47.8
20th	42.8	47.0	47.8	47.8	46.8	44.8	41.8	39.9	39.7	39.8	41.4	46.1	51.1	53.8	51.6	50.1	48.6	48.5	48.3	47.8	48.9	47.3	48.8	48.7
21st	48.5	48.8	48.9	49.4	48.6	47.8	44.9	41.5	38.0	38.5	43.7	50.8	55.0	58.6	56.9	53.7	50.8	48.9	47.7	48.7	48.8	46.3	44.1	47.8
22d	46.3	47.8	46.4	47.3	47.8	46.8	44.7	39.7	37.5	36.5	40.5	45.5	50.8	55.8	53.7	51.8	55.7	50.7	49.6	44.7	46.9	46.9	46.5	46.1
23d	46.0	46.6	46.8	47.2	47.4	46.7	44.0	41.9	36.4	34.1	37.2	43.8	51.8	56.6	55.8	52.5	49.9	49.6	49.6	50.0	50.4	49.9	49.2	48.9
24th	48.6	50.6	51.8	51.4	51.7	51.1	48.8	43.1	35.7	32.1	34.0	41.0	48.4	53.9	56.8	55.7	52.8	50.5	48.3	47.8	47.8	47.6	46.8	46.8
25th	46.5	46.7	47.0	47.6	47.8	47.1	45.6	41.9	37.9	36.7	39.7	45.0	51.6	56.8	58.0	55.8	45.8	48.5	48.6	50.8	52.8	52.8	51.9	51.5
26th	50.8	50.8	51.3	51.8	51.8	51.0	49.7	46.8	44.0	42.0	44.0	47.8	56.9	62.9	64.7	61.9	58.8	57.8	57.9	58.5	59.6	59.8	59.0	58.9
27th	59.1	59.1	59.3	59.0	59.8	61.7	58.2	54.1	52.1	49.0	49.6	52.6	54.8	57.8	61.8	61.3	61.4	62.2	61.8	59.7	57.8	57.8	56.9	58.8
28th	58.9	57.8	57.6	57.8	58.1	57.2	55.4	51.7	48.0	51.1	51.7	48.7	52.9	56.8	61.5	62.5	61.2	58.4	57.8	59.0	58.3	58.0	56.9	58.8
29th	57.4	56.8	55.8	55.8	55.3	54.8	54.4	52.4	49.2	46.9	47.0	52.3	57.2	58.8	59.7	55.9	55.8	55.6	55.5	55.1	54.9	54.0	54.0	54.8
30th	55.2	55.5	54.9	54.9	52.8	51.0	46.1	44.7	41.5	40.3	42.0	48.0	53.8	56.4	57.0	56.9	54.9	54.4	54.9	57.1	58.3	58.8	58.1	57.1
31st	56.8	56.3	56.3	56.1	55.6	54.9	54.1	49.8	45.9	43.8	47.0	51.1	56.6	58.7	57.4	55.8	53.8	48.3	46.8	52.8	53.8	54.8	54.8	54.8
Means	49.72	49.65	49.58	49.64	49.78	49.12	47.66	45.05	42.15	40.93	43.40	47.18	51.25	55.41	56.20	55.13	53.89	52.40	51.54	51.44	51.15	50.82	50.11	50.54
Normals	48.44	48.96	49.09	49.05	49.43	48.45	47.07	44.16	42.14	40.76	43.90	47.30	51.79	55.53	55.83	54.40	53.56	51.33	51.03	50.39	50.22	50.44	48.69	49.53

MAGNETIC DECLINATION DURING THE MONTH OF FEBRUARY 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	53.7	52.8	51.9	51.8	51.0	50.8	48.9	46.5	43.5	41.8	43.2	47.9	51.6	53.2	(54.0)	54.8	54.3	53.0	53.0	53.1	53.8	54.0	54.1	53.8
2d	53.8	53.7	53.6	53.7	53.5	53.1	51.6	49.0	44.0	40.6	40.3	48.9	55.8	58.6	60.1	58.6	54.9	51.8	50.2	51.0	52.3	51.9	54.8	55.0
3d	54.8	54.6	54.1	53.6	52.8	51.8	51.7	47.5	42.8	41.2	43.2	47.1	51.1	54.0	55.6	55.5	52.8	49.3	46.8	46.7	48.1	47.9	48.2	48.9
4th	49.3	49.5	50.1	50.4	51.1	51.3	49.1	45.1	40.0	36.3	39.9	46.8	50.9	54.8	58.3	58.3	55.5	51.6	48.7	48.6	49.8	49.6	48.2	50.1
5th	49.8	50.3	49.5	49.8	49.0	47.9	47.8	46.0	40.9	36.8	36.9	40.6	48.6	54.8	57.6	57.3	55.3	52.4	48.6	47.1	46.8	46.8	46.8	46.8
6th	48.7	47.3	46.7	47.9	49.2	49.6	45.3	42.1	37.9	36.1	36.1	46.1	55.1	60.6	60.9	57.8	53.8	49.8	47.3	46.0	46.0	46.0	46.5	46.0
7th	45.9	46.2	46.0	45.8	45.6	45.3	43.1	38.7	36.5	35.1	39.8	45.3	51.4	55.6	56.4	55.7	52.6	49.0	46.8	46.0	45.9	46.5	46.7	46.4
8th	47.1	46.7	46.5	46.8	46.1	46.0	44.1	41.2	38.8	36.7	38.8	45.1	50.0	53.9	55.0	55.6	54.7	53.2	51.7	49.5	49.3	48.0	48.1	46.0
9th	47.1	47.4	47.0	45.3	47.1	47.1	46.0	41.9	39.3	37.4	41.1	47.1	53.0	57.3	60.0	58.9	56.9	53.6	51.4	51.6	51.4	51.4	49.8	45.9
10th	46.4	43.1	(42.1)	41.1	44.8	47.7	41.0	43.1	45.2	42.7	47.2	52.3	56.2	60.2	63.8	61.1	60.5	56.8	53.0	45.9	52.2	49.1	52.1	51.0
11th	51.7	51.4	50.9	50.5	53.4	50.4	49.2	48.7	46.2	44.4	45.9	50.6	54.7	58.5	58.2	57.3	56.4	55.6	53.6	55.2	54.6	54.1	54.6	53.4
12th	52.4	50.3	52.4	52.7	52.4	51.4	51.8	49.1	46.7	45.4	46.3	50.6	55.4	59.4	61.4	60.3	57.7	54.4	52.4	53.2	53.2	53.4	53.4	50.6
13th	53.4	53.2	53.4	53.2	52.7	54.1	52.4	49.4	46.7	44.7	47.2	51.4	57.0	60.4	61.1	60.0	56.9	54.1	52.0	53.6	54.4	54.4	54.3	53.6
14th	52.3	52.3	52.4	52.4	53.1	53.3	51.7	49.0	45.6	41.7	41.6	45.8	52.4	58.4	60.8	60.5	59.2	56.2	53.3	53.9	54.7	54.4	53.4	52.5
15th	52.7	52.4	52.0	52.0	52.4	52.4	51.0	48.5	46.3	44.5	44.3	46.9	51.4	56.7	60.0	60.5	59.5	57.4	55.4	52.6	52.3	52.1	52.1	51.9
16th	51.5	50.4	50.6	51.0	48.2	51.2	51.7	47.1	48.7	49.4	49.7	55.4	59.6	63.1	63.5	63.5	59.9	57.7	54.9	53.4	52.5	52.9	52.4	48.5
17th	53.4	53.4	51.4	55.3	55.3	53.6	52.0	49.7	45.4	44.2	50.4	54.2	57.5	62.7	64.5	65.3	61.5	59.4	56.2	54.5	53.5	53.4	50.8	53.3
18th	53.2	53.4	54.3	54.2	53.2	53.2	53.2	49.2	45.0	42.5	43.3	48.7	54.1	58.5	61.1	59.4	57.2	54.7	52.5	50.9	51.5	51.9	44.8	49.2
19th	51.3	52.4	51.7	52.3	51.8	51.3	49.3	46.8	42.4	39.7	43.5	50.4	56.2	60.0	60.3	59.1	56.7	53.9	51.8	51.0	51.6	51.5	48.7	48.8
20th	50.4	50.4	50.2	50.4	49.4	49.6	48.2	45.3	43.2	43.2	45.3	48.4	52.1	55.0	57.4	57.6	56.4	55.5	54.1	52.3	52.1	52.3	51.5	51.2
21st	49.4	49.4	48.6	50.3	50.4	49.8	47.8	44.7	42.4	40.8	42.3	47.2	52.4	56.6	58.7	57.9	55.5	54.0	52.9	51.9	51.5	50.9	50.6	50.4
22d	50.3	48.7	50.0	50.2	50.3	50.2	48.5	44.3	41.2	39.7	40.8	44.8	49.9	54.1	57.5	58.4	56.4	54.5	53.4	52.4	52.4	52.4	51.9	51.4
23d	50.7	51.0	51.4	51.6	51.9	50.8	48.7	43.5	44.2	38.1	45.4	51.5	52.4	55.3	61.6	61.1	58.4	56.7	53.6	53.3	51.5	52.7	51.4	50.6
24th	47.4	44.8	43.9	45.5	44.6	49.3	46.5	43.9	45.4	52.7	49.5	51.4	55.5	58.3	60.4	58.6	57.9	56.6	55.6	54.4	52.7	49.7	46.1	36.9
25th	43.5	42.2	41.4	45.6	46.5	46.4	45.2	45.1	41.7	40.8	43.4	46.8	51.4	56.3	56.8	57.2	55.7	53.8	48.5	51.3	50.9	48.5	47.6	46.4
26th	46.4	46.4	48.4	49.2	50.4	51.1	48.7	45.7	43.1	41.7	44.5	49.7	55.2	59.4	60.6	59.4	57.2	54.2	53.3	52.7	52.8	47.4	44.6	40.9
27th	37.5	40.4	32.0	43.9	53.3	51.5	48.4	45.2	41.7	42.6	45.7	50.3	53.2	55.7	57.9	58.1	56.9	54.5	53.6	53.4	53.4	52.5	51.9	(47.8)
28th	43.8	45.8	49.5	50.5	49.6	49.3	46.8	45.7	42.9	42.6	45.4	50.6	55.7	59.5	61.0	59.6	57.2	53.4	52.7	52.4	52.4	52.2	51.5	51.2
Means	49.57	49.28	49.00	49.89	50.32	50.34	48.56	45.79	43.13	41.55	43.61	48.64	53.56	57.53	59.45	58.84	56.71	54.18	52.05	51.35	51.56	51.00	50.25	49.23
Normals	50.35	50.21	50.22	51.17	50.99	50.70	49.10	43.72	43.58	42.14	43.62	48.47	53.52	57.12	59.46	58.41	56.53	54.57	52.66	52.44	52.20	51.54	50.51	49.66

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF MARCH 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	50.7	50.7	50.3	50.3	50.2	49.9	49.7	46.0	44.2	43.7	43.9	51.7	50.5	55.5	57.3	56.6	54.3	51.9	50.5	51.5	52.0	52.5	52.2	52.4
2d	52.4	52.4	52.4	52.4	52.4	51.7	52.1	50.4	47.6	46.4	48.4	52.1	56.1	58.4	59.1	58.2	56.5	54.0	52.4	51.6	51.6	52.3	52.1	51.2
3d	50.3	49.7	51.7	51.5	51.9	50.9	49.4	47.4	45.0	44.5	46.3	51.4	57.2	60.5	61.2	59.2	57.6	55.3	53.6	53.5	52.1	5.3	51.4	52.0
4th	51.6	51.5	51.4	49.2	51.6	44.3	50.4	47.7	45.3	50.9	50.6	52.1	54.4	55.4	58.3	57.3	55.4	53.6	52.2	52.3	50.4	48.4	47.4	49.4
5th	49.8	47.0	43.3	48.9	50.1	51.4	49.4	49.6	47.3	47.1	47.4	50.3	53.2	55.0	56.5	54.8	53.3	51.5	51.0	51.0	50.1	50.4	50.4	49.5
6th	49.2	50.2	48.7	49.3	49.7	48.0	48.9	47.1	43.1	45.4	46.0	49.5	55.9	57.4	59.6	60.4	57.5	53.7	51.7	52.4	52.0	56.7	48.6	48.6
7th	50.4	49.9	49.9	49.4	49.4	49.2	47.7	45.4	43.3	42.4	54.4	49.7	56.6	61.1	62.3	61.5	58.8	54.5	52.2	51.5	52.1	50.7	50.7	50.3
8th	50.2	49.9	50.5	50.0	49.8	49.6	48.9	46.2	42.7	41.4	42.7	49.2	54.6	59.1	61.3	60.8	57.7	54.4	53.2	53.0	52.9	51.7	51.6	51.4
9th	51.4	51.4	50.7	51.2	51.1	50.6	49.7	46.4	43.6	41.3	42.8	47.1	54.9	60.9	61.6	60.6	59.0	(55.7)	52.5	51.2	52.7	51.4	51.2	50.6
10th	50.3	50.1	48.7	47.3	47.2	48.4	47.1	44.6	41.1	41.7	42.4	47.7	54.8	58.3	60.3	59.8	57.9	54.4	52.8	53.7	54.4	53.9	52.1	51.4
11th	51.4	50.4	51.3	50.3	50.0	48.8	49.3	47.1	48.4	43.2	49.5	51.5	55.2	58.1	58.5	58.1	56.1	54.0	53.2	53.4	54.2	52.4	52.8	51.4
12th	51.6	50.4	50.4	51.4	48.4	50.5	50.4	48.7	46.0	45.1	44.3	48.6	53.7	54.7	58.2	59.0	(57.5)	56.1	53.6	53.2	54.0	53.7	53.5	53.3
13th	51.3	50.3	51.7	51.3	51.3	51.4	51.4	49.6	47.3	44.9	49.6	51.5	56.3	59.7	61.3	60.9	59.9	57.4	55.4	55.5	55.4	55.5	54.4	54.4
14th	54.1	53.6	53.6	53.6	53.4	52.6	52.6	51.0	49.4	48.5	50.0	53.9	57.5	59.5	61.2	59.7	57.7	55.3	54.5	54.5	54.6	54.4	52.4	54.4
15th	53.2	52.5	52.3	53.3	53.0	52.5	53.5	51.3	50.3	49.4	49.5	52.2	55.5	57.6	58.9	57.9	55.6	55.7	55.5	54.2	54.4	54.1	53.4	49.9
16th	53.4	52.0	52.2	51.6	51.6	51.5	50.3	50.2	47.9	47.7	48.7	51.0	53.2	55.4	56.2	55.8	53.9	51.7	53.4	55.0	54.6	52.8	53.2	52.3
17th	51.4	51.4	49.4	47.4	49.3	46.9	49.5	49.8	49.1	44.1	47.7	50.5	56.1	58.3	57.7	57.2	55.4	53.6	52.7	51.7	52.1	53.5	51.1	52.6
18th	48.6	50.7	47.3	50.4	50.9	51.2	50.5	49.1	47.1	48.2	48.2	52.3	55.3	58.9	57.3	56.7	56.3	53.0	52.4	51.9	52.8	53.6	53.5	50.5
19th	49.3	46.8	48.6	48.3	47.2	49.3	48.4	46.4	47.7	46.2	45.9	48.9	42.4	46.7	58.4	56.5	55.2	53.6	52.3	51.4	50.4	50.4	50.4	50.6
20th	50.5	50.4	50.3	50.0	49.3	49.4	48.4	47.6	46.3	45.3	47.4	49.3	52.4	54.3	55.2	54.7	54.2	52.4	51.6	51.4	50.7	50.4	50.0	50.4
21st	49.4	49.3	49.3	48.3	48.9	48.4	47.4	46.4	45.0	44.8	46.9	51.0	55.3	58.3	58.8	57.8	55.4	53.0	52.4	50.3	50.3	49.4	44.8	49.7
22d	51.4	46.4	46.4	48.5	47.2	52.4	49.2	48.4	47.2	47.1	48.2	51.5	54.1	56.8	59.2	58.1	57.1	54.7	53.7	52.8	51.9	51.5	45.9	50.5
23d	50.1	50.3	50.4	50.6	51.2	53.5	49.7	49.0	46.7	45.1	45.8	48.1	52.4	56.5	59.2	58.5	56.5	53.8	52.4	52.1	53.6	53.5	46.0	51.4
24th	51.2	51.2	51.3	51.5	51.3	51.3	50.8	49.2	47.1	44.4	45.5	48.0	53.0	59.0	61.5	61.8	61.4	59.7	53.4	52.1	51.8	46.4	43.2	47.4
25th	45.5	47.3	47.4	46.5	51.0	50.2	49.6	46.3	44.3	45.7	45.2	47.4	50.6	53.4	55.2	56.4	53.7	52.6	51.4	51.4	50.2	48.4	42.0	46.4
26th	47.8	45.5	46.1	46.6	49.2	48.4	50.4	50.2	47.7	46.9	47.2	50.5	54.2	55.7	57.1	57.3	55.0	52.8	51.6	46.4	48.5	47.4	42.6	47.6
27th	44.4	45.4	43.8	44.3	43.4	46.4	47.4	45.4	48.3	49.4	50.2	51.3	53.6	53.7	53.4	54.2	53.4	49.5	50.4	50.7	48.4	48.1	48.9	41.6
28th	45.1	42.4	46.3	50.9	50.5	50.4	48.9	46.3	48.7	49.2	47.4	48.6	50.6	53.6	55.1	(54.3)	53.6	52.5	51.1	44.2	51.2	50.1	48.4	50.4
29th	48.8	52.5	50.1	56.9	49.6	48.9	48.4	49.9	49.1	47.7	46.5	49.4	52.0	53.4	54.9	53.9	52.8	52.8	52.4	51.4	50.0	50.4	46.2	47.9
30th	48.4	50.3	49.4	46.7	48.5	48.2	49.4	50.8	49.8	47.4	52.3	53.5	55.6	58.0	57.9	57.8	51.4	52.5	52.5	51.6	44.3	49.4	44.4	47.4
31st	43.7	40.6	43.5	49.1	48.2	45.3	49.3	47.3	44.8	44.6	47.2	50.2	54.7	58.0	55.6	56.6	53.4	50.6	50.4	56.4	43.7	45.4	48.6	49.5
Means	49.90	49.44	49.31	49.90	49.90	49.73	49.62	48.09	46.50	45.80	47.42	50.32	54.13	56.91	58.38	57.82	55.95	53.85	52.53	52.04	51.53	51.26	49.46	50.53
Normals	50.67	50.15	49.93	49.86	50.11	49.91	49.62	48.09	46.68	45.78	47.52	50.32	54.52	57.25	58.55	57.82	55.92	53.65	52.53	52.51	52.05	51.44	50.67	50.43

MAGNETIC DECLINATION DURING THE MONTH OF APRIL 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	48.4	47.2	46.4	47.4	48.7	52.3	50.8	50.6	44.7	45.8	45.3	49.9	54.5	56.1	56.3	56.0	53.9	50.9	50.4	42.4	45.5	48.6	47.8	45.7
2d	47.4	44.1	49.2	48.4	51.3	56.5	48.6	46.5	44.6	44.1	48.3	50.5	54.3	56.8	57.4	55.8	54.4	52.1	51.3	51.2	49.2	51.4	50.8	50.9
3d	50.6	49.5	50.6	49.4	49.2	52.9	50.1	47.6	45.4	45.2	46.9	51.1	55.5	57.0	57.4	57.5	56.2	54.0	52.4	51.5	50.5	50.5	50.5	50.5
4th	50.5	50.5	54.2	56.3	49.9	49.4	49.6	46.3	45.1	45.4	48.2	51.4	55.3	56.2	56.8	54.3	52.9	52.1	51.8	(50.7)	49.6	51.2	50.9	50.5
5th	50.3	50.2	51.1	50.4	49.8	49.9	48.9	47.1	45.3	44.7	46.5	50.5	54.4	57.3	58.7	58.5	55.5	53.9	48.9	50.3	50.1	50.3	49.5	50.2
6th	49.5	44.6	43.4	48.4	49.4	49.4	48.0	46.5	44.3	44.4	45.4	52.0	55.6	57.9	59.2	57.5	55.3	53.2	52.2	50.4	49.4	49.1	49.1	49.2
7th	49.1	48.9	43.4	48.2	48.6	48.1	47.2	45.2	43.7	44.4	43.9	52.2	58.1	56.3	57.6	58.4	58.5	55.4	51.4	50.5	49.2	48.5	48.5	48.6
8th	42.4	47.6	46.5	47.0	49.2	46.4	46.2	44.0	42.3	42.3	44.5	48.5	52.4	55.2	57.2	55.1	53.3	50.4	49.4	48.4	47.4	48.3	48.4	48.4
9th	47.4	47.3	43.3	47.4	48.4	48.0	47.5	46.2	44.5	42.6	44.4	41.4	55.4	58.5	59.5	57.4	56.5	53.2	52.5	50.2	48.2	48.0	48.2	47.7
10th	47.9	47.7	48.3	47.7	48.3	48.2	47.5	45.4	43.6	41.1	41.3	45.8	50.5	53.8	56.0	54.4	53.3	51.6	50.3	49.5	49.0	48.9	48.5	47.5
11th	46.6	47.4	47.4	47.7	47.4	47.4	46.4	46.1	44.5	43.3	43.4	46.1	49.8	52.4	53.4	52.1	50.8	50.4	49.6	49.7	49.3	48.5	47.5	47.5
12th	46.3	44.4	45.9	46.4	46.9	46.9	46.9	46.3	45.1	44.5	45.5	48.2	51.0	54.0	53.5	54.4	51.6	52.4	51.5	50.1	49.6	46.5	47.9	47.6
13th	47.3	47.7	47.4	47.8	47.4	46.4	45.7	45.3	44.9	47.6	48.9	(49.5)	(50.0)	50.6	53.5	53.3	50.7	50.5	49.3	48.4	48.2	48.2	45.5	41.4
14th	46.7	47.4	46.8	46.4	46.0	46.3	45.5	43.7	45.3	44.0	45.4	46.4	48.5	51.8	52.9	52.5	50.9	48.4	49.3	48.9	48.4	47.7	46.4	45.5
15th	43.5	43.2	49.4	46.9	46.7	46.4	45.9	44.7	43.8	43.5	46.1	50.4	52.5	54.2	52.7	50.9	49.4	48.7	48.1	47.5	47.4	47.4	46.7	46.7
16th	46.5	47.2	47.2	46.4	48.4	45.9	46.6	46.1	43.7	42.3	43.3	45.5	50.0	51.5	52.1	51.2	50.2	50.0	49.4	47.7	47.3	48.2	47.3	46.7
17th	46.4	46.4	44.9	45.5	45.9	46.0	45.5	44.4	43.5	43.6	45.1	47.9	50.3	52.6	52.1	50.7	49.3	48.5	47.5	47.2	46.9	46.8	46.7	45.9
18th	45.9	46.1	46.4	45.8	45.4	46.1	45.3	44.3	42.7	42.9	44.5	47.0	50.8	54.4	55.4	54.0	51.6	49.6	48.8	48.4	47.4	46.4	46.4	45.4
19th	44.4	43.9	45.4	44.4	45.6	45.6	45.4	44.3	43.4	43.3	44.1	46.2	49.5	52.5	53.8	(52.6)	51.4	49.4	48.4	47.6	49.3	47.4	45.6	45.8
20th	45.8	46.4	46.4	45.9	45.0	45.5	45.3	44.1	43.2	42.2	43.4	46.6	50.5	53.4	54.4	54.4	50.9	49.9	49.5	48.6	48.2	47.6	47.5	47.3
21st	46.5	46.5	46.5	46.5	46.4	46.3	45.4	44.9	43.7	42.8	43.9	45.7	49.9	52.3	52.3	(52.3)	52.4	50.4	49.3	48.1	47.8	47.1	44.9	44.4
22d	42.9	33.4	35.6	41.2	31.6	47.3	48.5	52.1	50.4	42.5	42.6	50.7	52.4	50.8	50.5	49.0	48.2	46.5	46.1	45.5	45.1	45.2	44.4	44.4
23d	44.4	44.6	45.3	45.4	43.6	43.1	44.7	47.8	41.2	40.3	40.4	44.9	49.2	50.6	53.6	52.2	50.3	49.2	45.9	43.5	43.5	43.4	43.8	42.4
24th	40.5	40.7	41.7	40.4	47.4	48.3	47.5	46.4	43.9	42.2	47.4	49.4	49.8	50.6	50.5	53.9	47.9	47.4	47.3	44.9	36.5	42.9	43.4	44.0
25th	41.7	44.5	45.2	44.7	45.2	45.3	44.3	43.7	44.5	44.4	42.5	45.5	48.4	51.8	52.9	52.2	51.6	47.5	39.4	46.1	45.5	42.4	40.9	44.3
26th	43.9	44.4	46.1	45.2	44.4	45.3	45.3	44.0	43.4	42.5	45.4	46.3	48.8	51.5	53.0	52.4	51.2	48.4	47.4	46.4	46.0	44.7	41.6	42.4
27th	43.5	44.0	45.8	44.9	44.3	45.0	47.4	44.3	43.4	41.4	41.8	44.7	47.4	50.5	50.8	51.2	48.4	46.4	45.6	44.6	43.9	43.4	43.4	43.4
28th	43.6	43.4	43.6	40.3	44.5	42.5	42.5	41.6	40.6	40.6	42.3	44.7	47.3	49.9	50.4	49.5	48.4	46.8	45.9	44.4	42.2	42.4	43.3	42.4
29th	43.5	42.9	42.5	42.0	43.9	44.1	43.5	42.7	41.7	39.1	43.2	48.3	47.3	48.9	50.6	51.1	49.7	48.4	45.4	45.3	38.4	37.9	38.2	39.4
30th	36.8	35.6	38.4	45.3	40.1	42.7	44.5	45.9	45.0	47.8	47.3	47.6	51.1	52.1	52.4	52.6	(53.9)	55.3	58.4	52.5	52.6	47.9	45.6	47.8
Means	45.68	45.26	45.81	46.12	46.30	47.12	46.50	45.61	44.08	44.62	47.65	51.28	53.33	54.28	53.64	52.00	50.32	49.00	48.03	47.07	46.92	46.35	46.13	
Normals	45.67	45.89	45.78	46.91	46.89	46.65	46.50	45.57	44.77	44.62	47.65	51.28	53.33	54.28	53.64	52.00	50.32	49.33	48.23	47.78	46.89	46.73	46.38	

FLAGSTAFF OBSERVATORY.

15

MAGNETIC DECLINATION DURING THE MONTH OF MAY 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	51.3	50.4	50.4	50.3	50.1	49.3	49.3	49.4	48.2	47.3	48.3	48.0	50.7	52.1	52.8	53.1	52.4	52.1	50.8	51.1	51.0	50.1	50.3	48.9
2d	47.8	49.7	49.3	49.4	48.9	48.8	48.8	48.4	47.3	46.6	47.7	50.8	52.9	54.2	55.4	55.4	51.9	51.5	51.3	49.5	48.7	48.4	49.0	48.0
3d	47.3	48.6	48.3	49.3	47.5	49.3	48.5	47.3	46.6	46.1	47.8	49.6	53.3	(53.2)	53.2	53.1	52.6	51.3	48.3	48.0	(48.4)	48.8	48.8	49.3
4th	46.5	48.6	46.3	51.0	49.5	48.6	48.3	47.6	46.1	43.7	46.5	48.3	51.3	54.3	55.4	54.0	54.7	51.9	49.0	48.0	48.1	48.3	48.3	47.6
5th	47.3	48.7	48.2	47.3	47.0	46.6	46.8	47.9	47.2	46.2	47.3	49.3	50.3	53.9	57.4	58.4	56.8	56.1	51.8	48.8	46.6	45.3	46.4	46.6
6th	46.4	46.3	46.3	45.3	44.4	45.1	45.2	44.3	42.6	43.8	46.4	49.4	51.4	52.8	54.1	54.3	51.3	49.3	47.1	48.3	47.3	47.4	46.6	46.4
7th	46.2	45.8	43.4	45.1	45.3	43.8	45.8	45.5	44.5	44.3	45.3	46.3	49.1	50.5	50.7	49.6	48.5	46.8	46.4	46.7	46.2	45.4	47.8	44.4
8th	43.3	43.0	42.1	43.2	43.6	43.0	43.0	42.5	41.6	41.6	41.0	45.1	46.5	47.8	48.3	50.0	46.7	47.2	(46.7)	46.3	46.4	46.3	46.0	45.3
9th	45.7	46.2	46.3	46.4	46.4	45.6	44.5	42.1	43.3	44.4	46.8	47.5	49.3	49.6	50.2	49.2	48.5	47.2	45.9	45.3	45.3	45.3	41.0	42.3
10th	44.3	44.4	41.9	44.7	43.7	43.0	42.1	43.3	42.4	42.3	42.3	44.1	45.2	46.4	48.3	49.7	49.3	47.5	45.8	44.5	43.5	43.1	42.5	42.4
11th	42.1	42.3	42.3	42.3	32.2	42.3	41.3	41.3	40.9	40.3	40.8	45.6	45.9	48.1	49.5	52.0	52.2	47.3	45.5	44.2	43.1	43.0	42.9	42.6
12th	43.1	42.8	42.8	43.2	43.3	43.4	43.4	43.5	43.2	41.3	42.2	42.1	43.4	45.4	46.4	47.3	46.3	44.3	42.6	43.0	40.4	40.5	40.5	37.4
13th	39.4	39.3	38.6	38.6	40.3	41.2	43.2	41.2	40.7	41.0	40.7	44.1	46.4	48.3	49.5	48.7	48.1	45.7	43.8	43.1	42.3	41.3	41.3	40.4
14th	39.4	38.9	40.8	39.6	39.2	40.2	39.7	39.5	39.2	38.7	39.4	41.3	44.1	45.4	46.7	45.7	45.4	42.8	42.4	41.3	41.3	41.3	41.3	41.8
15th	41.6	42.1	41.5	41.6	42.4	41.5	41.3	41.3	41.1	40.3	39.5	38.5	41.5	44.8	46.4	46.8	45.4	42.7	41.3	41.2	40.7	40.4	40.6	40.5
16th	40.3	39.9	40.5	41.3	41.3	41.3	41.3	41.5	42.0	40.3	41.4	42.4	44.8	47.1	48.1	(46.3)	(44.4)	(42.6)	40.8	40.6	40.4	40.6	40.6	40.6
17th	41.1	42.8	41.8	41.4	41.7	41.3	41.1	41.0	39.6	39.4	(40.7)	(42.0)	43.3	44.3	(43.6)	(42.8)	(42.1)	41.3	41.1	40.9	40.2	39.6	39.3	39.0
18th	39.3	40.3	41.0	41.3	41.9	41.8	41.6	41.1	40.5	40.8	(43.2)	(45.6)	(48.0)	50.4	(49.4)	48.4	47.3	46.5	43.4	42.3	42.4	41.5	42.3	42.3
19th	42.3	42.4	42.6	42.9	43.1	43.0	42.5	42.4	42.0	40.8	(41.3)	41.9	42.6	44.9	45.6	46.0	43.0	41.4	40.2	39.7	39.3	39.3	41.5	37.3
20th	45.9	37.9	33.8	39.5	36.6	36.8	39.3	40.2	40.3	38.6	(40.2)	(41.7)	43.3	44.4	45.2	(43.7)	(42.3)	(40.8)	39.3	39.4	38.5	39.3	39.6	39.4
21st	38.6	39.3	43.3	40.3	40.3	40.3	40.3	40.1	40.3	42.1	(43.1)	(44.0)	(45.0)	46.0	46.4	44.0	44.4	45.3	39.2	40.1	36.9	36.2	38.2	37.6
22d	38.2	38.6	39.5	38.6	38.6	37.8	38.3	37.5	37.5	38.4	38.5	42.2	45.1	44.3	46.2	45.1	42.7	40.2	38.4	37.3	37.3	35.3	35.3	35.3
23d	35.5	34.5	37.6	36.8	37.9	38.4	38.3	37.6	37.4	37.0	37.7	39.6	41.8	44.4	43.7	43.1	42.3	40.5	37.3	33.7	35.5	33.0	35.3	35.3
24th	35.5	35.2	35.1	34.6	35.6	36.1	35.1	34.0	33.5	33.3	35.7	38.8	41.7	44.0	44.9	44.0	41.8	39.4	36.3	35.3	34.4	33.6	33.4	32.7
25th	34.2	34.0	34.3	34.6	34.4	34.8	34.4	33.5	33.0	33.0	(36.0)	(39.1)	42.1	42.3	(41.4)	(40.5)	(39.6)	(38.7)	37.8	35.4	34.5	33.6	31.4	32.1
26th	33.3	34.3	35.3	36.3	36.6	36.3	36.3	35.5	34.8	34.5	36.3	39.3	41.8	43.2	44.0	42.8	41.3	41.3	40.4	39.3	38.6	38.1	38.1	38.0
27th	38.2	38.3	38.3	39.2	38.5	38.0	37.4	37.0	36.6	35.4	35.5	34.4	35.3	38.2	38.9	40.3	41.4	37.3	35.8	34.4	34.2	33.6	35.6	33.9
28th	33.1	33.3	34.0	34.7	34.8	34.4	34.5	33.6	33.0	32.8	34.4	36.2	38.9	41.8	40.9	(39.7)	(38.5)	37.3	35.3	34.3	33.3	33.1	32.3	32.3
29th	32.6	32.7	33.3	33.4	33.6	33.6	33.0	33.6	33.3	32.3	32.4	34.3	37.3	38.4	38.6	39.9	39.0	36.2	36.3	34.0	33.3	31.8	31.8	31.2
30th	31.6	27.0	31.5	35.5	31.0	29.5	30.6	30.3	29.6	31.1	—	—	—	52.1	54.1	55.2	54.3	(54.5)	54.7	49.1	51.0	50.0	49.1	49.6
31st	49.5	49.5	48.8	50.0	50.4	49.3	48.3	49.5	48.6	48.2	48.1	50.8	52.3	55.1	55.6	56.3	55.3	52.5	53.3	53.2	51.5	51.3	50.3	50.4
Means	41.32	41.20	41.26	41.86	41.30	41.46	41.44	41.16	40.51	40.15	41.47	43.39	45.43	47.33	48.07	47.95	46.79	45.19	43.53	42.54	41.95	41.44	44.53	40.83
Normals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAGNETIC DECLINATION DURING THE MONTH OF JUNE 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10	11
1st	50.1	50.2	49.7	49.5	49.2	49.3	49.2	49.3	48.9	47.9	47.8	49.2	52.2	53.4	54.3	53.9	52.3	50.3	50.1	51.0	50.6	49.5	49.2	49.0
2d	49.0	49.0	49.6	48.6	49.3	48.5	48.2	48.0	47.4	46.0	45.8	46.4	49.4	52.4	53.1	53.4	52.5	51.0	50.8	50.3	49.4	48.7	48.3	47.4
3d	46.4	46.5	46.5	48.2	49.5	48.9	49.4	48.6	47.6	46.5	45.1	45.3	47.3	49.6	53.0	53.7	51.6	49.5	49.7	49.3	48.5	47.8	47.2	47.3
4th	47.0	46.6	46.5	46.2	46.2	46.2	45.6	45.4	44.4	42.9	43.5	45.9	49.6	52.3	54.5	54.2	(51.3)	48.4	49.6	49.0	48.9	46.5	45.6	42.6
5th	45.3	44.8	46.3	45.3	45.3	44.3	44.5	45.0	44.0	43.5	44.5	46.7	51.2	53.3	54.8	52.4	51.3	48.3	48.3	47.3	46.4	45.4	45.0	44.6
6th	44.4	44.4	44.7	44.4	45.1	44.3	44.4	44.5	43.2	42.3	43.1	45.2	48.1	53.3	54.7	53.3	52.0	49.3	48.3	47.5	47.3	46.3	46.5	44.5
7th	43.9	43.7	43.8	44.9	45.2	44.7	44.6	44.3	43.0	44.7	45.1	46.3	50.3	50.5	51.5	52.3	51.3	50.0	48.3	46.6	45.9	46.0	43.7	46.3
8th	46.2	46.1	46.2	46.0	46.0	46.4	46.8	47.1	45.6	44.3	43.7	44.0	46.4	50.3	51.6	52.4	51.8	45.8	51.8	51.3	46.1	44.6	40.3	41.3
9th	46.3	45.3	47.3	42.8	52.9	40.1	45.8	45.8	44.3	43.3	42.3	43.6	45.8	47.2	48.3	50.2	50.3	49.5	44.4	44.2	45.5	43.3	42.0	42.2
10th	41.8	44.5	42.3	42.1	43.3	42.3	42.3	42.0	41.8	41.0	41.4	41.6	44.4	46.3	47.4	48.5	48.1	46.3	45.3	44.2	43.2	42.5	42.3	41.3
11th	42.0	42.3	42.4	42.3	42.5	42.5	42.8	43.0	40.6	41.7	42.1	43.1	44.2	47.6	49.4	49.0	49.5	46.4	45.3	44.4	44.4	44.4	42.6	42.3
12th	41.3	41.1	41.5	42.1	42.3	42.3	42.3	42.6	42.4	41.1	40.9	41.7	33.4	46.7	47.5	48.4	48.3	47.2	46.2	44.8	43.6	42.7	42.3	42.3
13th	42.6	43.3	43.1	44.4	42.6	41.8	41.4	41.4	(41.3)	41.3	41.1	41.4	42.3	46.4	50.3	49.0	46.9	44.7	43.1	41.7	41.0	40.5	40.1	41.4
14th	39.9	40.3	40.6	41.1	40.8	41.3	41.3	41.2	41.0	39.8	39.2	40.2	42.9	44.6	45.8	45.3	42.7	41.3	40.8	40.3	42.0	39.5	39.3	38.8
15th	38.8	38.7	38.4	37.3	38.5	38.3	38.3	38.4	37.1	35.6	35.3	36.4	38.3	40.1	43.2	42.8	41.9	41.9	40.1	40.2	39.2	38.8	38.3	38.2
16th	37.6	35.3	36.0	36.4	36.5	37.0	35.2	33.5	36.1	35.4	35.4	36.6	40.6	41.4	41.4	42.1	40.8	39.2	38.7	39.8	36.3	34.3	33.3	35.3
17th	32.6	32.6	37.3	36.2	36.5	36.3	36.3	36.4	36.2	41.0	38.4	37.3	40.3	43.2	45.2	45.6	44.0	41.4	42.1	41.4	40.4	39.7	38.7	38.2
18th	38.0	37.7	37.5	38.2	36.3	37.6	37.2	37.4	38.6	35.9	36.2	38.4	40.2	43.4	43.4	44.9	44.4	43.3	41.3	41.3	42.3	42.5	39.9	38.1
19th	38.8	38.8	39.1	38.8	38.8	(38.3)	(37.9)	37.4	37.1	36.0	35.4	36.8	38.4	40.3	41.7	42.3	41.3	39.4	39.4	39.0	38.6	38.0	37.5	37.3
20th	37.4	37.2	38.0	38.2	38.2	37.3	37.3	37.1	36.0	34.4	35.1	36.1	38.4	41.4	41.6	40.3	40.6	39.2	38.5	37.6	38.1	37.3	36.9	36.3
21st	35.6	35.6	36.4	36.2	36.5	36.6	35.6	35.2	34.4	33.6	33.7	34.9	37.2	40.4	42.7	44.0	44.1	41.4	41.3	39.3	38.3	38.2	37.3	37.3
22d	36.6	36.2	36.9	36.8	37.1	36.7	36.0	35.6	33.7	33.3	36.4	38.1	39.5	41.1	43.0	40.2	38.4	37.4	36.4	35.3	34.8	34.3	34.3	
23d	34.1	33.8	34.3	34.8	35.3	39.2	34.3	33.6	33.1	32.4	32.3	34.1	36.7	39.8	40.5	40.9	40.2	36.8	36.4	35.3	34.7	33.0	32.3	32.1
24th	33.3	32.5	32.4	32.3	33.2	33.2	32.9	32.8	31.6	30.9	31.5	32.9	35.4	39.3	42.1	42.5	41.0	38.2	38.2	37.3	36.8	36.3	35.3	33.9
25th	34.8	34.4	34.3	33.6	33.8	34.3	34.3	34.1	33.1	22.1	31.3	32.4	36.6	38.4	41.0	43.3	42.7	41.5	41.3	39.3	36.2	34.2	34.0	30.5
26th	31.6	31.3	29.3	31.3	31.2	30.6	31.8	31.3	30.4	29.4	29.4	30.9	33.9	37.3	38.5	39.8	36.4	38.4	37.3	34.3	35.3	33.4	36.2	35.4
27th	33.6	32.9	31.7	33.3	32.4	32.8	33.1	—	33.8	33.5	31.6	31.0	33.3	34.7	35.8	34.9	35.3	35.3	34.3	33.9	33.3	26.9	31.4	32.1
28th	32.2	32.3	32.3	32.3	31.6	31.3	32.3	—	32.3	32.0	31.4	31.5	32.2	33.1	34.3	34.3	33.4	33.0	32.3	31.3	31.4	31.0	30.8	30.3
29th	30.3	30.4	30.4	30.3	30.6	30.5	30.8	31.0	30.8	29.4	28.5	29.2	30.3	32.5	34.4	34.9	34.4	33.0	32.3	31.7	30.8	30.3	28.5	29.2
30th	29.2	28.8	28.9	28.9	28.9	28.5	28.6	28.7	28.6	28.4	28.2	28.4	30.6	32.4	34.3	35.3	34.3	32.1	32.4	32.2	31.3	30.4	33.1	29.5
Means	39.36	39.22	39.46	39.43	39.85	39.38	39.37	39.23	38.68	38.00	37.75	33.80	40.93	43.70	45.25	45.56	44.50	42.68	42.17	41.41	40.70	39.53	39.07	38.64
Normals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

As I have already mentioned, in addition to the influence exerted by the geological formation on the values of the magnetic elements, as determined at the Flagstaff Observatory, there were others caused by buildings and building alterations, which seriously interfered with my labours on Terrestrial Magnetism. S. 40° W of the little house, in which all absolute determinations were made, and only 104 yards distant from it, stood an iron house, which exerted *some* (however trifling) influence, as was subsequently proved on its removal. This took place on the 7th—10th of February, 1859, and caused the magnets in the Horary House, at the same distance from it, to oscillate slightly. Another source of great annoyance arose in the month of October, 1859, when alterations in the cutting of King Street made it exceedingly difficult to continue magnetic registration. The blasting going on in connexion with these labours, during the time from the 19th of October to the end of that month, set the magnets in continual motion; so much so, as to render an exact registration of the instruments utterly impossible. On my representations the Government interfered on behalf of the Observatory, and the blasting operations were stopped, though not without having previously done some permanent injury to the pillars upon which the differential instruments were mounted. This manifested itself, especially after heavy rains, from the date of the commencement of the alterations in King Street, to the end of the working of the Flagstaff Observatory — being most observable in January, February, July, and August, 1862 — thus causing blanks in the records, which I shall have to point out when treating of the results of the observations on the various elements. These latter alterations affected more directly the readings of the differential instruments in the Horary House. But others, as, for instance, the erection and working of a saw-mill on the 22nd of June, and another on the 13th of November, of the same year, could not fail to influence the absolute determination of the elements, thus causing the Observatory to become quite untenable. But it was not until the 21st of September, 1862, three years after the commencement of these grievances, and but five months prior to the end of the period over which the observations forming the subject of these discussions, extend, that a new era began, and systematic registrations on Terrestrial Magnetism were taken up at the New Observatory a locality perfectly unobjectionable in every respect, and already recognised by me as such early in 1857, after a mature examination of the results of my respective observations on different localities.

It was indispensable for the full appreciation of the subsequent discussions and observations, to make some mention of the difficulties under which the Magnetic Observatory laboured, as it is evident that they must have impaired to some extent the efficacy of its working.

2. There cannot exist any occasion for entering upon a full description of the various buildings forming part of the Observatory, as such description has already been given at various times and in various publications ("R. I.," Introduction, pp. 215—217, and "Transactions of the Philosophical Society of Victoria," Vol. III., 1858, pp. 94—97). It would be equally superfluous to give a full account of all the instruments used in making the observations, as they have been fully enumerated in "R. I.," pp. 216, 217; and are, by Professor Lamont's writings, well known to every one conversant with the subject of Terrestrial Magnetism. The same remark applies with respect to the mode of reducing the observations; the more so, as a detailed account of it has already been printed in my first publication on Terrestrial Magnetism ("R. I.," pp. 218, 236, 241, and 244).

With respect to the instruments used for the hourly observations, I have yet to add a few words. Up to the month of June, 1861, the same instruments were used, though since the 20th of October, 1860, new scales had been employed; but as there seemed to be good

reason to suspect the presence of metallic iron in the cases of the instruments, an extensive series of observations was undertaken with the sole object of determining the amount of the influence such iron exerted, if it exerted any whatever. The respective observations were made on the 30th of May, 1861. The result was, that there did not exist any perceptible influence caused by iron in the metal of which the cases were made; and consequently, as far as that was concerned, the instruments might have been retained. But as it had become necessary to have some other repairs done to them, new instruments were put in their places, and the registration recommenced on the 5th of June, 1861. Observations on the absolute values of the magnetic elements, up to the commencement of 1861 usually made in the Absolute House, had become useless for reasons above described, and it was therefore thought advisable to mount the old set of differential instruments in this house, which was accordingly fitted up for that purpose. In September, 1861, a series of *day* observations was commenced, and continued until the 21st of September, 1862, when systematic registrations on Terrestrial Magnetism were taken up at the New Observatory. But during the last two months of that period (July and August, 1862) the instruments hitherto in the Horary House (new set) had to be removed, and were placed in the New Observatory, in order to enable me to continue for some time simultaneous readings in both places, with the object of comparing the respective results. During the months of July and August and to the 21st of September, 1862, the observations printed hereafter and included in the discussions, were made in the Absolute House, and with the aid of the old set of instruments.

TEMPERATURE IN THE HORARY HOUSE.

3. The influence of changes in temperature on the observations on horizontal force and inclination, so seriously interfering with their value, was sought to be reduced to a minimum by every available means. For, although it is well known that in observing the horizontal force deflecting magnets, compensated for temperature, are made use of in Professor Lamont's instruments, it was not considered safe to trust too much to the efficacy of this arrangement, especially not for a great range and a high degree of temperature. Guided by these considerations, the construction of the Horary House was adapted for being sunk in the ground, double walls and doors and a double skylight keeping out any sudden change in temperature of air. With regard to the skylight, the precaution was used of drawing a curtain over it during the daytime; and the light of the lamp used in illuminating the scales at night was screwed down quite low, and only lit up during the registrations. The instruments themselves were again put under glass covers, leaving merely a square opening for the reading of the scales, thus preventing any sudden current of air from affecting the temperature of the magnets. Notwithstanding all these precautions, I considered it of the utmost importance to record the temperature within the Horary House, together with the magnetic instruments. The thermometer was for this purpose enclosed within a glass tube, and suspended close to the walls of the building, thereby causing it to be as nearly as possible under the same conditions as the magnets with respect to temperature and sudden changes therein. The following five tables contain the monthly mean temperatures for every hour and the single years of observation; another table shows the same values, the five years being thrown into one.

MEAN TEMPERATURE IN THE HORARY HOUSE, MAY TO DECEMBER, 1858, AND JANUARY AND FEBRUARY, 1863.

MONTHS.	Mid-night.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858.																								
May	56.85	56.54	56.32	56.12	55.87	55.71	55.55	55.28	55.38	55.84	56.64	57.87	59.23	60.20	60.78	60.78	60.46	59.86	59.11	58.59	58.08	57.71	57.28	56.95
June	51.36	51.21	51.03	50.84	50.54	50.39	50.65	50.16	50.06	50.25	50.98	49.96	52.99	54.08	54.37	54.84	54.91	54.48	53.78	53.14	52.71	52.19	51.79	51.50
July	49.00	48.68	48.44	48.21	48.21	48.00	47.90	47.72	47.70	47.85	48.41	49.16	50.28	51.10	51.61	51.94	52.05	51.73	51.18	50.61	50.13	49.77	49.43	49.22
August	50.77	50.47	50.30	50.10	49.95	49.67	49.53	49.39	49.32	49.81	50.62	51.92	52.94	53.89	54.42	55.01	55.11	54.49	53.70	52.96	52.34	51.87	51.47	51.13
September	52.41	52.13	51.84	51.56	51.21	51.15	50.99	50.79	51.02	51.75	52.93	54.06	55.25	56.15	56.73	57.19	56.96	56.42	55.60	54.66	54.05	53.45	52.93	52.52
October	56.80	56.30	55.98	55.51	55.10	54.81	54.79	54.81	55.44	56.99	58.04	60.12	61.67	63.15	63.74	63.84	63.32	62.72	61.91	60.50	59.56	58.73	58.08	57.47
November	61.51	60.99	60.53	60.18	59.70	59.43	59.26	59.68	60.97	62.40	63.85	65.27	66.89	67.79	68.19	68.32	67.68	67.59	66.75	65.62	64.58	63.49	62.93	62.31
December	62.93	62.56	62.24	61.81	61.50	61.15	61.06	61.49	62.37	63.86	65.17	66.64	67.92	69.04	70.53	71.87	69.64	68.83	68.44	67.36	65.96	65.13	64.54	64.26
1863.																								
January	68.69	68.17	67.31	67.26	66.99	66.06	66.22	65.88	66.30	67.04	67.60	69.67	70.90	71.91	72.25	72.21	72.47	71.37	71.07	70.00	69.42	69.44	68.91	68.67
February	67.26	66.94	65.80	66.33	65.38	64.92	65.09	64.73	64.73	65.88	66.17	66.95	68.20	68.66	69.50	69.77	69.59	69.09	70.03	67.85	68.70	67.76	67.51	68.44

MEAN TEMPERATURE IN THE HORARY HOUSE DURING THE YEAR 1859.

MONTHS.	Mid-night.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
January	66.69	66.06	65.65	65.15	64.86	64.77	64.53	64.66	65.52	66.54	67.61	68.93	69.99	70.56	71.09	71.63	71.38	70.67	70.64	69.85	68.77	68.25	67.43	67.07
February	64.57	64.30	64.08	63.26	62.88	62.38	62.18	62.21	62.90	64.26	65.33	66.62	67.47	68.44	69.07	70.04	69.89	69.63	69.10	68.36	67.35	66.68	65.99	65.51
March	61.92	66.20	61.25	61.02	60.80	60.35	60.12	60.12	60.12	61.02	62.15	63.27	64.40	65.30	66.20	66.42	66.42	65.97	65.30	64.40	63.72	63.27	62.82	62.37
April	58.55	58.32	58.10	57.65	57.42	56.75	56.97	56.97	56.97	57.65	58.77	60.12	61.47	61.92	62.37	62.60	62.37	62.37	61.70	61.02	60.35	60.12	59.67	59.00
May	54.27	54.05	53.82	53.60	53.37	53.37	53.15	52.92	52.92	53.15	54.72	55.62	56.07	56.30	56.75	57.20	57.20	56.97	55.85	55.62	55.17	54.72	54.50	54.05
June	53.15	52.70	52.70	52.47	52.25	52.02	52.02	52.02	51.35	51.12	50.00	50.67	51.35	52.02	52.47	52.70	52.70	52.70	52.70	52.47	52.47	52.02	51.80	51.57
July	50.00	49.55	49.55	49.32	49.10	49.10	48.87	49.10	48.20	48.20	48.87	49.55	50.22	50.90	51.12	51.35	51.57	51.35	51.12	50.90	50.90	50.45	50.22	50.00
August	51.80	51.35	51.35	51.12	50.90	50.67	50.67	50.00	50.00	50.22	50.90	51.80	53.37	53.60	53.82	54.72	54.27	54.05	53.82	53.60	53.15	52.92	52.47	52.25
September	53.15	52.92	52.47	52.25	51.80	51.57	51.12	51.12	51.12	51.80	52.92	54.50	55.40	55.20	56.52	56.75	56.75	61.02	55.40	55.17	54.72	54.72	54.05	53.60
October	57.83	57.57	57.18	56.78	56.36	56.16	55.69	55.14	56.01	56.95	58.24	59.56	60.78	61.38	62.15	62.47	62.30	61.39	60.25	60.37	60.04	59.54	59.06	58.60
November	60.47	60.54	59.94	59.76	59.50	59.02	58.81	58.94	59.70	60.65	61.72	62.85	64.10	64.95	65.66	65.92	65.55	64.74	63.78	63.41	62.76	62.29	61.77	61.32
December	66.02	65.55	65.26	64.66	63.83	63.73	63.19	63.77	64.59	66.16	67.69	69.09	70.52	71.32	72.12	72.11	71.83	71.31	71.16	70.32	68.98	68.71	67.77	66.99
Means	58.20	58.26	57.61	57.25	56.92	56.66	56.44	56.41	56.62	57.31	58.24	59.38	60.43	60.99	61.61	61.99	61.85	61.85	60.90	60.46	59.95	59.47	58.96	58.53

MEAN TEMPERATURE IN THE HORARY HOUSE DURING THE YEAR 1860.

MONTHS.	Mid-night.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
January	67.38	66.87	66.29	65.76	65.28	65.06	64.59	64.98	65.79	67.13	68.87	70.42	71.82	72.96	74.04	75.94	74.58	73.42	72.78	71.85	70.78	69.82	68.74	68.46
February	65.35	64.94	64.11	64.07	63.68	63.26	62.70	62.86	63.25	64.90	66.53	68.00	69.13	70.04	70.63	70.91	70.94	70.46	69.54	68.79	68.14	67.39	66.84	66.22
March	66.39	65.97	65.65	65.29	64.93	64.64	67.06	64.05	64.05	64.55	65.88	67.09	68.28	69.34	69.76	70.07	70.06	70.02	69.48	69.07	68.43	67.79	67.32	66.95
April	61.31	61.04	60.62	60.41	60.12	59.72	59.65	59.11	58.96	59.33	60.28	61.47	62.33	63.00	63.58	63.90	63.89	63.99	62.70	63.14	62.69	62.28	61.91	61.58
May	56.68	56.48	56.25	55.98	55.84	55.51	55.44	55.17	54.79	54.92	55.66	56.48	57.28	58.01	58.34	58.42	58.60	57.93	58.21	58.03	57.74	57.38	57.14	56.95
June	52.10	51.83	51.56	51.55	51.15	50.89	50.60	50.40	50.04	49.99	50.50	51.24	52.16	53.03	53.53	53.87	53.77	53.98	53.59	53.20	52.95	52.72	52.37	52.06
July	49.57	49.25	48.93	48.80	48.50	48.43	48.52	47.77	47.34	47.90	47.65	48.82	50.01	50.18	51.38	51.86	51.87	52.06	51.62	51.01	50.62	50.46	50.01	49.90
August	51.22	50.90	50.73	50.41	50.21	49.84	49.70	49.69	48.76	48.96	49.92	50.91	51.93	52.60	53.33	53.73	53.77	53.19	53.62	52.90	52.45	52.41	51.82	51.74
September	53.66	53.43	53.01	52.72	52.41	52.07	54.24	51.38	51.68	52.49	53.58	54.81	56.01	57.00	57.52	57.61	57.62	56.66	56.96	56.33	56.06	55.47	54.90	54.49
October	56.89	56.42	56.16	55.68	55.58	55.23	54.49	54.92	55.26	56.10	57.12	58.17	59.08	59.76	60.09	60.15	59.97	58.80	59.51	58.94	58.61	57.96	57.64	57.20
November	60.03	59.67	59.30	58.91	58.62	58.36	58.38	58.21	58.83	59.76	60.96	62.29	63.60	63.96	64.74	64.89	64.43	64.02	62.83	62.77	62.56	62.10	61.29	60.93
December	63.80	63.03	63.02	62.46	62.02	62.33	61.57	61.20	62.70	63.43	64.86	66.05	67.25	68.07	67.94	68.83	68.20	67.64	68.23	66.56	65.88	65.63	64.53	64.71
Means	58.70	58.32	57.97	57.67	57.36	57.11	57.24	56.64	56.79	57.45	58.48	59.65	60.74	61.50	62.07	62.51	62.31	61.85	61.59	61.05	60.58	60.12	59.54	59.26

FLAGSTAFF OBSERVATORY: 1858—63.

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MEAN TEMPERATURE IN THE HORARY HOUSE DURING THE YEAR 1861.

MONTHS.	Mid-night.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
January	66.97	66.79	66.48	66.05	65.74	65.33	64.62	64.84	65.75	66.31	67.43	68.71	69.74	70.18	70.97	70.83	70.77	70.40	69.54	68.38	68.52	68.00	67.38	67.65
February	65.15	64.83	64.41	64.23	63.67	63.70	62.82	62.71	62.91	63.92	65.21	66.61	67.87	68.75	69.26	69.62	69.46	69.37	68.02	68.73	67.72	67.13	66.60	65.93
March	66.44	65.46	65.29	65.00	64.73	64.73	62.88	63.40	63.69	64.42	65.55	67.01	68.24	69.19	69.73	69.90	69.84	69.34	68.84	68.63	67.95	67.48	66.86	66.58
April	60.57	60.40	59.92	59.68	59.41	59.17	58.57	57.72	58.13	58.89	59.99	61.22	62.37	63.25	63.56	64.11	64.03	64.16	61.88	62.72	62.32	61.77	61.42	60.97
May	54.87	54.52	54.21	53.85	53.54	53.35	53.15	52.62	52.73	53.31	53.75	55.10	55.77	56.72	56.99	57.49	57.44	57.02	56.68	56.15	55.78	55.41	55.06	54.73
June	51.49	51.41	51.16	50.84	50.66	50.48	50.44	48.08	48.70	50.17	50.69	51.44	52.55	53.54	54.10	54.59	54.52	54.47	53.71	53.21	52.73	52.40	52.14	51.83
July	48.52	48.35	48.18	48.03	47.79	47.60	47.46	47.33	46.88	47.12	47.87	48.90	50.08	50.93	51.20	51.66	51.47	51.51	50.61	50.19	49.77	49.38	49.10	48.82
August	50.27	49.87	49.43	49.09	48.81	48.41	48.23	48.04	47.90	48.41	49.60	51.24	52.77	53.64	54.30	54.64	54.57	54.14	53.47	52.74	52.18	51.64	51.17	50.87
September	54.34	53.91	53.52	53.13	52.75	52.40	51.94	52.33	51.61	52.71	54.16	55.76	57.02	58.10	58.90	59.15	58.93	58.66	58.12	57.57	56.94	56.26	55.70	55.16
October	58.71	58.31	57.78	57.37	57.00	56.61	56.47	56.20	56.87	53.10	59.40	60.71	61.69	62.52	63.03	63.20	63.12	62.69	61.56	61.53	61.05	60.41	59.90	59.50
November	61.05	60.48	60.03	59.60	59.16	58.19	58.71	58.51	59.33	60.61	62.17	63.59	64.82	65.77	66.21	66.75	65.94	65.35	64.71	64.35	63.58	62.90	62.34	61.83
December	63.50	63.05	62.64	62.21	61.78	61.07	60.82	61.04	61.92	63.09	64.37	65.52	66.50	67.34	67.95	68.71	68.07	67.51	66.92	66.69	65.56	64.82	64.27	63.83
Means	58.49	58.11	57.75	57.42	57.09	56.75	56.34	56.07	56.37	57.25	58.35	59.65	60.78	61.66	62.18	62.55	62.35	62.05	61.17	60.91	60.34	59.80	59.33	58.97

MEAN TEMPERATURE IN THE HORARY HOUSE DURING THE YEAR 1862.

MONTHS.	Mid-night.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
January	67.10	66.77	66.25	65.82	65.39	64.99	64.19	64.61	65.59	67.01	68.54	70.24	71.43	72.70	73.44	75.25	73.57	72.60	71.75	70.88	70.95	69.57	68.77	68.11
February	67.10	66.64	66.28	66.65	65.96	65.65	64.75	64.66	65.05	65.88	66.99	68.30	69.21	69.93	70.81	70.41	70.00	69.98	70.01	69.79	68.67	68.27	67.73	67.35
March	66.34	65.91	65.46	65.20	64.80	64.41	63.79	63.49	63.56	64.19	65.13	66.38	67.61	68.90	69.07	69.38	69.39	69.31	69.48	68.46	68.03	67.65	67.14	66.72
April	59.04	58.74	58.50	58.26	57.98	53.73	57.23	56.90	56.98	57.30	57.58	58.37	59.16	59.91	60.31	60.50	60.52	60.21	60.10	60.44	60.08	59.83	59.51	59.43
May	54.67	54.40	54.27	53.32	53.92	53.74	53.37	52.89	52.62	52.55	53.36	54.00	54.42	55.05	55.23	55.55	55.70	55.33	55.43	55.32	55.20	55.02	55.01	54.68
June	51.08	50.90	50.79	50.57	50.37	50.23	49.96	49.14	49.25	48.92	49.32	50.11	50.67	51.21	51.99	51.90	51.83	51.94	52.04	51.64	51.48	51.97	51.12	50.94
July	49.58	48.82	49.30	49.07	48.38	48.98	48.39	49.25	48.30	48.68	48.93	50.02	50.86	51.49	51.40	51.61	51.70	51.25	51.12	50.89	50.62	50.40	50.33	50.17
September	58.00	57.42	56.82	56.70	56.27	56.40	56.03	55.50	55.55	56.03	56.08	57.27	57.96	59.32	59.48	59.02	58.95	59.30	58.77	59.15	58.17	57.80	57.27	54.80
October	60.19	59.77	59.04	59.23	58.09	57.66	57.82	57.99	57.66	58.53	59.41	60.61	61.87	62.20	63.06	63.22	63.16	63.22	62.93	62.05	62.66	61.61	61.40	60.41
November	64.41	63.56	63.59	62.97	63.01	61.80	62.16	62.28	62.52	63.54	64.34	65.60	66.97	67.63	67.78	68.26	67.94	67.85	67.21	66.63	66.31	66.11	65.04	64.77
December	65.89	65.29	64.71	64.26	63.85	63.19	62.82	62.73	63.13	64.37	65.47	66.82	67.94	69.04	69.36	69.95	69.42	69.59	68.67	69.32	67.69	68.24	67.43	67.11
Means	59.70	59.21	58.92	58.68	58.30	58.05	57.64	57.57	57.60	58.19	58.90	60.04	60.99	61.85	62.23	62.51	62.24	62.07	61.84	61.59	61.13	60.83	60.33	59.72

Note: The temperature for August was not observed, but in taking the yearly mean it was interpolated and taken into consideration.

MEAN TEMPERATURE IN THE HORARY HOUSE DURING THE YEARS 1858—1863.

MONTHS.	Mid-night.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	Noon.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
January	67.37	66.93	66.40	66.01	65.65	65.24	64.83	64.99	65.79	66.81	68.01	69.59	70.78	71.67	72.36	73.17	72.55	71.69	71.16	70.19	69.69	69.02	68.25	67.99
February	65.89	65.53	64.94	64.91	64.31	63.98	63.51	63.43	63.77	64.97	66.04	67.30	68.38	69.16	69.85	70.15	69.98	69.71	69.34	68.70	68.12	67.45	66.93	66.69
March	65.27	65.88	64.41	64.13	63.81	63.53	63.04	62.76	62.85	63.97	65.00	65.67	67.65	68.78	69.31	69.29	69.65	68.66	68.27	67.64	67.03	66.55	66.03	65.65
April	59.87	59.62	59.28	59.00	58.73	58.34	58.10	57.67	57.76	58.29	59.15	60.29	61.33	62.02	62.45	62.78	62.70	62.70	61.59	61.83	61.36	61.00	60.63	60.24
May	55.47	55.20	54.97	54.57	54.51	54.33	54.13	53.78	53.68	53.96	54.83	55.81	56.55	57.26	57.62	57.89	57.88	57.42	57.06	56.74	56.39	56.05	55.80	55.47
June	51.84	51.61	51.45	51.25	50.99	50.80	50.73	49.96	49.88	50.09	50.30	50.68	51.94	52.78	53.20	53.58	53.55	53.55	53.16	52.73	52.47	52.26	51.84	51.58
July	49.33	48.93	48.88	48.69	48.40	48.42	48.23	48.23	47.68	47.95	48.35	49.29	50.29	50.92	51.34	51.68	51.73	51.58	51.01	50.72	50.41	50.09	49.81	49.62
August	51.01	50.65	50.45	50.18	49.96	49.65	49.53	49.28	48.99	49.35	50.26	51.46	52.75	53.43	53.97	54.52	54.43	53.97	53.65	53.05	52.53	52.21	51.73	51.50
September	54.31	53.96	53.53	53.27	52.90	52.72	52.86	52.22	52.20	52.96	53.93	55.28	56.33	57.15	57.83	57.94	57.84	58.41	56.97	56.58	55.99	55.54	54.97	54.11
October	58.08	57.67	57.23	56.91	56.43	56.09	55.85	55.81	56.25	57.33	58.44	59.83	61.01	61.82	62.41	62.58	62.37	61.76	61.23	60.68	60.38	59.65	59.22	58.64
November	60.98	60.57	60.22	59.85	59.58	59.07	58.99	59.03	59.68	60.72	61.84	63.13	64.47	65.20	65.71	65.99	65.59	65.25	64.35	63.88	63.31	62.76	62.07	61.66
December	64.43	63.90	63.57	63.08	62.60	62.29	61.89	62.05	62.94	64.18	65.51	66.82	68.03	68.96	69.58	70.29	69.43	68.98	68.68	68.05	66.81	66.51	65.71	65.38
Means	58.65	58.37	57.94	57.65	57.32	57.04	56.81	56.60	56.79	57.55	58.47	59.60	60.79	61.60	62.14	62.49	62.31	61.97	61.37	60.90	60.37	59.92	59.42	59.04

On examining these tables somewhat more closely, we learn that the diurnal fluctuations of the temperature within the Horary House are considerably reduced with respect to their amount, when compared with those of the temperature in the open air. The amplitude of the temperature in the Horary House is, for the summer season 45 per cent., for the winter 35 per cent., and for the equinoctial quarters 39 per cent., of the amplitude of temperature of air, thus showing a considerable reduction; but in order fully to appreciate the efficacy of the construction adopted, it must be borne in mind that the above percentages apply only to average values: and that, in reality, for single days of a great range in temperature, those percentages have been still more considerably reduced. We find, for instance, on the 14th of January, 1862, a range in temperature of air amounting to $41^{\circ}5$; while that in the Horary House for the same day was but $16^{\circ}3$, which would make the latter only 39 per cent. of the former, 45 per cent. being the average for the summer season. The maximum temperature takes place in the Observatory, for hourly registrations at about 3^h 15^m p.m., and the minimum at 7^h 30^m a.m., taking an average for the whole year. From this we perceive that there exist considerable differences in the turning-points in the daily oscillations in the temperature of the air and of that in the house referred to, whereby is adduced an additional proof of its isolating qualities with regard to temperature. The mean temperature for the year in the Horary House is $59^{\circ}38$, being $1^{\circ}55$ higher than that of the air. This excess is greatest in the winter season, being then about $2^{\circ}0$, and diminishes to $0^{\circ}8$ only during December and January.

The Horary House in the New Observatory was constructed on a somewhat different plan to that of the Flagstaff Observatory. In the latter, the water gathering round the pillars, whereon the instruments stood, interfered most seriously with the observations; so much so that, when called upon to make a plan of the buildings forming the present Magnetic Observatory, my principal care was directed to the avoidance of this great drawback of the underground arrangement; and accordingly it was determined to erect the new Horary House on a level with the ground, and to form an artificial mound round its walls, which would serve the same purpose of preventing the sudden communication of the temperature of the air to that in the interior of the building. The above tables show clearly that no material change took place in the New Observatory with respect to the state of the temperature within, inasmuch as the ranges in temperature and its mean values appear to have been unaltered, when compared with those observed at the Flagstaff Observatory.

II. MAGNETIC DECLINATION.

HOURLY OBSERVATIONS.

4. PRIOR to entering on a discussion of the observations on the hourly motion in the Magnetic Declination, we subjoin here the complete series of observations for nearly five years, during which time the Observatory continued systematic registration. The arrangements for the reception of the instruments were not yet completed at the time when the observations on meteorology were taken up, viz. the 1st of March, 1858; and it was therefore necessary to defer the opening of our labours in that branch of physical science to the 1st of May of that year.

FLAGSTAFF OBSERVATORY.

9

MAGNETIC DECLINATION DURING THE MONTH OF MAY 1858.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	43.8	43.8	44.0	43.9	43.1	43.0	43.0	42.6	41.3	40.9	41.8	43.0	45.8	47.8	47.3	47.0	45.9	45.0	45.2	45.5	43.0	43.9	43.6	43.9
2d	43.0	42.0	42.2	42.1	41.5	40.0	41.3	42.0	42.1	41.3	41.0	42.0	44.1	46.2	43.0	45.7	46.6	45.5	44.8	44.0	44.0	43.8	43.2	43.5
3d	43.5	43.7	43.8	43.6	43.9	43.0	43.0	42.6	42.2	40.9	40.9	41.9	43.9	46.8	47.9	47.2	46.3	45.8	45.0	44.3	44.0	44.0	43.5	43.6
4th	43.5	43.8	43.8	43.5	43.8	43.3	42.5	42.3	40.9	39.6	40.1	42.2	46.0	47.7	48.8	48.3	48.0	46.0	45.0	44.0	44.1	43.8	43.7	43.8
5th	43.4	43.3	45.0	43.9	43.8	44.0	43.1	—	42.0	40.0	40.9	42.0	44.9	47.0	48.0	47.8	46.9	45.3	43.8	44.4	44.1	43.8	43.3	43.5
6th	43.5	43.6	43.9	43.9	43.9	44.0	43.5	43.1	42.2	41.0	40.8	41.9	44.8	47.1	48.9	48.3	46.8	45.9	45.2	45.0	44.3	43.8	43.6	43.5
7th	43.3	43.0	43.6	43.0	44.0	43.8	43.1	42.8	42.0	41.7	42.3	43.1	44.6	46.8	46.9	46.4	46.0	45.0	45.0	44.0	43.5	43.2	43.0	43.0
8th	43.0	43.3	43.1	44.3	44.3	44.0	43.9	41.5	43.8	41.0	42.0	45.2	46.3	52.4	56.7	53.5	50.1	50.0	44.5	44.1	27.3	43.8	43.7	46.8
9th	43.3	44.3	46.0	47.0	44.1	47.1	45.6	44.0	45.0	42.0	43.3	43.3	46.5	45.0	47.7	48.0	49.7	41.7	44.0	44.0	41.0	38.6	38.7	40.7
10th	45.8	43.2	43.5	44.9	45.5	44.9	44.0	43.8	46.9	47.4	43.3	43.2	46.0	45.9	48.5	49.9	43.0	46.0	44.6	39.0	43.5	43.1	42.8	47.0
11th	41.0	43.0	42.5	46.0	46.0	44.1	44.5	43.9	43.0	42.0	40.7	42.0	44.2	47.0	50.0	47.4	47.6	44.9	44.8	44.1	43.0	42.0	43.2	43.6
12th	43.3	44.3	44.0	44.0	44.3	46.1	45.0	45.0	43.1	44.2	41.0	42.4	44.9	47.6	49.0	48.0	46.0	45.0	44.0	43.3	41.7	42.3	43.7	43.5
13th	44.0	43.9	45.0	44.4	44.0	44.0	44.5	45.1	44.3	41.2	40.8	42.8	45.5	47.8	47.6	47.3	46.7	44.9	43.9	44.2	43.3	43.8	43.8	42.5
14th	43.0	43.9	45.0	45.0	44.5	43.5	46.0	43.1	43.3	41.3	43.3	42.9	46.0	48.0	48.6	48.8	46.5	44.8	44.0	43.9	43.2	43.9	42.8	43.1
15th	43.0	46.4	45.0	45.1	45.0	44.1	43.5	44.0	43.2	41.6	41.2	42.3	44.1	46.8	48.1	48.2	47.5	46.0	45.0	44.0	44.0	43.9	43.9	43.9
16th	43.9	44.4	44.8	44.8	44.5	—	43.9	43.3	42.9	42.4	42.6	43.0	44.9	47.0	47.4	47.0	46.0	45.6	45.0	45.0	44.1	43.9	43.9	43.9
17th	44.0	44.3	44.0	44.2	44.4	44.6	44.0	44.0	44.0	43.3	44.8	46.2	47.0	48.0	49.0	49.6	49.1	47.0	45.5	44.7	44.0	43.9	40.3	42.7
18th	42.5	41.2	44.0	46.9	43.0	42.2	47.0	41.0	42.9	41.9	41.0	43.1	45.0	47.1	48.6	48.7	47.0	44.3	45.8	44.0	44.3	44.0	43.5	43.2
19th	43.1	44.0	44.0	45.0	45.5	44.0	—	43.9	43.1	41.8	41.7	42.2	42.9	44.6	47.0	48.5	47.2	45.3	44.9	44.2	44.2	44.0	44.0	43.6
20th	43.8	44.1	44.5	44.3	44.5	43.9	43.3	44.0	44.2	42.0	41.8	42.1	43.5	45.6	46.2	47.0	46.2	45.0	44.8	44.5	44.0	44.0	43.9	43.9
21st	44.0	44.4	44.4	43.8	44.8	45.0	44.7	45.0	43.2	42.0	40.9	42.0	44.0	47.0	48.2	49.1	46.2	45.9	45.0	44.8	44.2	43.8	43.5	43.2
22d	44.0	43.9	43.9	43.9	43.9	43.9	43.9	44.0	43.8	42.4	40.9	41.3	41.2	46.1	48.1	52.7	50.0	46.6	45.9	45.8	49.7	45.8	44.6	44.7
23d	44.0	43.0	44.0	45.1	45.0	44.2	44.0	44.0	41.4	43.1	42.4	42.4	45.0	46.9	47.9	48.0	47.1	47.0	47.0	47.2	46.8	44.5	43.7	44.5
24th	44.2	46.6	44.1	43.9	42.9	43.4	45.0	49.5	46.9	45.7	44.0	45.9	48.3	53.7	51.0	50.0	48.0	34.0	41.6	44.4	47.2	40.0	40.9	40.0
25th	38.9	38.4	42.9	44.2	45.8	44.0	44.9	44.6	44.3	43.4	43.0	43.8	45.1	46.9	48.0	47.7	46.7	45.6	45.0	44.8	45.0	44.8	42.8	43.1
26th	43.1	43.0	44.0	44.5	44.2	45.0	43.9	45.0	43.3	43.0	42.0	43.0	43.5	47.1	47.5	48.0	48.6	46.6	46.9	45.9	44.7	44.3	41.3	41.8
27th	44.0	44.0	44.6	45.0	45.0	45.0	45.0	45.0	43.9	43.0	42.8	42.9	44.1	46.0	47.9	48.3	47.4	45.8	45.7	45.0	46.2	45.9	43.5	43.0
28th	43.0	43.1	43.8	44.5	45.2	44.9	44.6	43.9	45.0	46.0	42.9	42.6	44.0	46.4	48.0	49.2	47.4	45.0	44.0	46.0	45.0	44.5	44.4	45.0
29th	44.3	44.1	43.5	46.4	45.0	44.4	45.1	44.5	45.6	45.2	45.2	46.0	47.0	47.8	48.5	47.9	47.1	46.2	46.0	44.3	46.8	45.9	44.4	43.1
30th	44.0	44.4	43.9	45.3	46.0	45.4	45.1	45.0	44.9	44.0	44.0	45.0	46.1	46.8	47.2	49.1	48.1	46.1	43.6	45.8	45.8	45.2	44.8	42.0
31st	41.2	43.3	45.0	45.0	45.0	45.0	45.0	45.0	44.9	44.6	45.9	46.0	45.9	45.4	48.8	49.0	49.0	49.0	47.0	45.1	45.1	44.9	44.5	43.5
Means	43.37	43.60	44.06	44.56	45.69	44.14	44.20	44.24	43.54	42.58	42.24	43.15	45.01	47.17	48.27	48.44	47.25	45.38	44.92	44.49	43.91	43.78	43.25	43.45
Normals	43.52	43.94	44.06	44.56	45.69	44.14	44.20	44.07	43.54	42.42	42.24	43.15	45.01	46.77	48.16	48.27	47.25	45.61	44.92	44.68	44.28	43.95	43.40	43.45

MAGNETIC DECLINATION DURING THE MONTH OF JUNE 1858.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	43.5	42.9	44.0	46.5	44.5	46.7	45.4	45.7	45.8	44.5	44.1	44.3	44.3	46.3	49.0	48.1	48.0	47.0	46.0	45.8	45.1	45.0	45.0	44.1
2d	44.9	45.0	44.5	45.0	45.6	45.8	45.2	45.1	46.6	45.4	44.7	44.5	45.0	46.9	48.9	49.0	47.2	46.0	45.1	45.0	45.6	45.5	44.8	43.0
3d	44.9	46.1	46.5	48.0	48.0	46.0	46.0	46.0	45.9	44.9	43.8	43.8	44.1	45.4	46.0	48.0	48.0	46.1	46.0	45.0	43.6	45.2	45.0	45.3
4th	45.0	46.8	46.0	46.0	46.5	47.0	46.0	46.0	45.8	45.0	44.4	46.1	50.8	47.1	48.9	49.3	51.9	46.0	47.0	46.5	42.5	36.1	42.7	41.5
5th	43.0	39.0	49.0	46.4	47.9	47.1	49.0	49.5	51.1	49.4	44.6	45.4	45.8	48.3	50.0	50.9	44.2	45.2	44.8	45.0	43.5	43.0	45.0	
6th	44.7	46.0	45.2	43.2	50.7	46.4	47.9	48.0	47.0	45.3	45.0	45.0	48.0	46.5	47.7	47.4	50.4	45.0	42.5	41.9	—	43.6	44.3	43.6
7th	44.5	45.7	46.0	49.5	46.2	47.0	46.5	49.0	50.3	46.6	45.9	44.8	47.9	47.2	47.9	50.0	46.6	45.0	41.9	45.0	42.6	43.0	45.1	45.5
8th	39.0	41.5	46.0	46.0	47.0	47.5	47.1	47.9	48.6	55.5	47.8	43.4	46.0	47.0	47.5	46.4	47.1	44.3	46.0	40.0	45.3	42.2	44.2	44.9
9th	40.0	45.6	45.1	47.8	47.6	45.6	45.1	46.0	45.8	43.6	43.0	44.2	44.6	—	47.9	47.0	47.0	46.0	43.5	45.0	45.2	43.0	45.0	45.2
10th	45.3	46.0	46.3	48.9	45.1	46.0	46.4	46.0	45.1	44.0	42.9	42.9	46.0	48.0	48.4	48.3	47.3	44.8	44.1	45.4	45.3	44.8	44.3	44.2
11th	45.0	45.7	46.0	46.0	46.0	45.5	45.6	46.0	46.1	45.0	44.0	44.3	45.2	47.0	47.4	48.9	47.1	45.7	45.4	45.9	45.9	45.5	45.4	44.9
12th	44.1	46.1	46.4	46.0	46.1	46.0	45.6	46.0	46.2	44.7	43.2	42.2	44.9	46.5	48.0	49.0	48.5	46.0	46.2	46.9	44.0	45.0	44.5	44.5
13th	45.0	45.0	41.7	45.5	—	45.5	46.2	46.0	46.1	45.0	43.7	45.0	47.1	46.4	48.3	50.0	49.1	46.0	46.0	46.9	45.1	42.3	44.0	45.0
14th	45.7	45.3	46.9	45.9	48.2	48.0	47.0	47.1	46.9	46.0	43.9	43.0	43.4	45.5	47.8	49.2	49.0	47.0	46.0	45.7	45.9	45.7	43.1	45.4
15th	46.0	46.0	46.2	47.0	46.9	47.5	47.0	45.9	47.8	47.0	44.8	44.5	45.0	47.2	49.9	49.3	48.4	46.0	46.0	45.9	45.5	45.1	45.1	45.0
16th	45.2	46.0	46.0	47.0	46.5	46.5	46.0	46.0	46.0	45.0	44.4	44.5	45.1	46.1	47.0	48.0	47.9	46.1	46.0	45.5	45.5	44.2	45.0	45.0
17th	45.6	46.1	47.0	47.1	46.8	46.8	46.3	46.5	46.6	45.8	45.0	44.0	45.0	46.1	49.3	51.1	49.0	47.0	47.0	46.4	45.5	44.9	45.0	45.1
18th	45.1	46.5	45.9	47.0	46.0	44.8	47.0	45.0	46.1	45.1	44.3	46.0	46.1	46.7	48.4	48.6	50.0	47.0	49.0	46.0	45.5	45.4	44.8	43.7
19th	45.0	45.1	45.8	45.2	46.0	46.5	45.3	45.8	46.0	45.8	44.9	45.1	46.2	50.1	51.0	54.3	49.8	46.7	46.3	46.3	45.9	44.5	43.1	44.9
20th	44.0	45.6	46.8	45.0	46.2	47.0	45.0	46.0	46.0	44.9	45.7	46.0	47.1	—	46.4	47.7	51.4	50.0	45.6	49.0	33.0	46.0	44.0	45.5
21st	41.7	43.2	44.8	46.6	47.5	46.8	46.3	46.2	47.1	46.5	44.6	42.6	43.9	47.0	48.0	47.3	47.4	47.1	46.0	46.5	47.0	48.5	48.0	43.5
22d	44.5	44.3	44.9	44.7	44.1	45.3	45.9	46.3	47.0	46.5	45.2	44.2	45.0	47.0	49.4	49.7	49.0	46.9	47.0	46.5	46.0	45.9	44.2	45.2
23d	45.0	46.0	45.9	46.9	47.1	47.1	46.7	47.3	49.7	47.0	47.0	45.1	43.9	47.0	49.3	51.9	55.0	57.2	45.9	47.4	42.0	39.0	44.9	45.9
24th	46.0	41.0	43.5	40.1	49.0	45.8	44.0	45.1	51.5	49.3	48.7	50.4	48.5	51.5	55.9	60.0	59.0	49.5	54.0	50.0	45.0	41.0	46.0	44.6
25th	41.0	41.1	39.6	42.1	43.2	43.6	49.8	60.8	56.1	52.8	53.0	49.1	48.0	47.0	49.5	51.3	51.0	37.4	52.0	47.1	44.1	44.1	44.9	44.1
26th	43.9	45.0	46.1	46.0	45.8	45.9	45.8	46.1	47.7	45.0	45.2	44.0	46.0	50.0	50.0	49.2	50.0	44.0	47.3	48.2	47.9	45.7	45.2	44.8
27th	44.9	45.0	46.3	46.5	50.0	48.0	47.5	49.5	48.1	46.2	45.0	—	—	47.3	48.7	49.0	48.4	45.6	48.0	47.8	48.2	46.4	44.9	45.2
28th	44.0	43.9	44.0	46.0	45.4	46.4	47.0	46.7	46.5	44.9	44.3	45.0	45.6	48.4	50.6	51.0	50.1	47.9	47.6	48.6	48.0	46.9	44.9	44.4
29th	45.0	46.1	46.0	46.6	47.0	46.8	47.8	47.5	47.1	45.4	49.8	46.5	49.9	48.3	50.0	51.1	51.0	50.0	48.6	48.1	47.0	46.0	45.9	46.0
30th	46.2	45.9	46.1	46.0	46.5	46.8	46.7	46.9	47.6	47.1	46.1	46.0	47.0	50.0	48.7	50.0	49.9	46.6	46.0	48.9	49.2	40.0	—	42.0
Means	44.36	44.78	45.49	46.02	46.67	46.39	46.43	46.99	47.47	46.31	45.30	44.82	46.01	47.42	48.86	49.70	49.29	46.50	46.43	46.27	45.05	44.11	44.70	44.57
Normals	44.70	44.98	45.69	46.22	46.67	46.39	46.43	46.52	47.47	45.75	44.86	44.70	45.84	47.42	48.62	49.17	48.91	46.45	46.11	46.49	45.48	44.75	44.70	44.57

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF JULY 1858.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	46.0	46.1	47.0	47.0	47.0	47.1	47.1	47.1	47.0	47.1	47.0	46.5	47.1	49.0	49.3	50.6	49.6	46.7	45.0	42.4	43.9	39.5	36.1	44.0
2d	45.0	44.0	47.1	50.0	49.2	48.0	47.5	48.0	48.3	47.7	45.7	44.0	44.4	46.3	48.0	48.3	49.0	47.0	44.0	49.0	39.8	46.0	43.7	45.5
3d	46.0	48.9	45.0	48.2	48.5	48.0	47.1	47.7	48.5	47.6	49.0	46.1	46.2	47.0	—	48.0	47.9	46.0	46.1	47.3	44.4	45.0	42.9	43.0
4th	42.9	39.0	47.0	46.7	50.0	56.0	59.9	47.9	47.9	48.4	45.1	45.0	47.1	47.4	48.9	49.1	48.0	48.2	47.0	44.4	42.3	44.6	37.3	42.5
5th	46.0	45.0	46.5	47.9	47.0	46.0	47.5	45.5	46.5	45.6	—	—	—	—	—	—	51.0	49.8	50.5	46.4	46.8	48.5	45.1	45.0
6th	37.0	35.5	38.1	38.0	44.0	50.0	59.5	60.0	61.5	61.9	54.4	48.8	46.7	46.0	46.0	47.3	48.0	47.6	52.2	48.2	47.1	45.1	44.0	44.0
7th	40.0	41.1	44.3	47.6	48.0	48.3	48.0	48.1	48.0	49.1	44.0	45.6	45.0	46.0	50.0	49.8	48.1	47.3	46.1	47.9	47.1	45.2	46.2	46.2
8th	47.0	46.0	46.1	47.4	47.2	47.2	47.0	47.5	48.0	47.1	46.1	46.0	46.6	47.3	48.5	49.9	47.0	—	—	47.0	46.6	46.8	46.8	46.9
9th	46.9	47.0	47.1	47.3	47.5	48.0	47.9	47.9	48.0	47.5	—	—	—	47.6	47.0	—	—	48.7	47.3	47.4	47.1	45.0	45.9	46.0
10th	47.0	47.4	48.2	49.0	47.3	48.0	48.3	48.2	48.0	46.6	45.1	46.1	47.0	47.9	49.1	51.9	50.2	47.0	47.0	45.4	46.2	45.9	45.9	46.4
11th	46.6	45.7	46.8	48.0	48.5	47.9	47.1	48.3	47.6	45.7	44.9	44.2	45.4	47.0	49.2	52.0	50.4	47.9	47.5	47.0	46.1	46.0	45.0	45.5
12th	46.8	46.6	47.0	47.9	47.9	48.1	47.0	49.3	47.6	46.2	44.4	44.8	46.6	47.7	49.4	51.8	50.0	47.9	46.9	46.4	46.6	46.5	46.5	46.5
13th	46.9	46.9	47.0	47.1	47.2	47.1	46.7	46.8	47.0	46.0	44.3	43.8	44.1	46.0	48.8	50.0	49.5	47.3	46.9	46.5	46.2	46.4	46.6	46.0
14th	45.1	46.0	47.2	48.0	47.8	47.1	48.0	48.3	47.0	46.4	46.0	46.1	47.0	47.8	48.4	49.3	49.1	47.7	47.0	46.8	46.8	46.7	46.6	46.0
15th	46.5	47.0	47.3	45.1	47.5	47.4	46.5	45.6	46.6	50.8	49.7	47.4	45.9	47.5	50.1	51.8	52.8	51.0	49.9	50.0	51.8	46.4	46.5	46.5
16th	44.0	44.9	43.4	46.7	47.0	47.5	47.1	47.2	47.0	46.0	45.8	46.2	46.0	47.0	50.0	40.3	49.0	48.3	47.0	48.0	47.0	48.0	50.0	45.0
17th	44.0	41.8	46.2	47.0	47.9	47.3	47.0	47.1	47.5	48.0	46.3	45.5	46.8	47.4	48.0	48.4	48.3	47.7	46.8	47.2	45.9	46.0	46.7	45.9
18th	46.0	47.0	46.9	47.0	47.2	47.0	47.0	47.0	46.3	45.9	45.0	44.9	46.3	48.9	51.0	51.6	50.8	48.0	47.0	47.0	46.8	46.6	46.6	47.0
19th	47.0	46.4	46.4	47.4	47.2	47.3	47.3	47.2	47.0	45.6	44.7	44.3	46.0	49.0	50.0	50.9	49.0	47.5	47.1	47.4	47.0	47.0	47.0	46.6
20th	46.7	46.8	47.0	47.1	46.3	46.5	47.9	48.0	47.0	45.0	44.6	44.7	46.3	49.1	49.5	51.0	50.0	48.5	48.0	48.5	47.9	49.3	47.0	46.2
21st	46.0	46.1	45.3	44.9	45.9	46.0	47.1	47.8	47.4	46.0	45.0	45.0	46.0	47.1	49.0	50.4	50.0	48.5	47.0	47.1	47.1	47.1	46.7	46.5
22d	46.7	46.5	46.5	47.7	47.8	47.6	47.1	47.5	48.0	47.0	45.9	45.0	46.0	47.8	45.0	50.6	50.0	47.9	47.3	47.0	47.0	47.1	47.2	47.0
23d	45.8	—	—	47.8	47.8	47.8	47.5	47.5	48.2	46.9	45.0	44.5	46.0	47.7	49.8	50.9	49.9	47.7	47.1	47.0	47.5	47.1	47.7	47.2
24th	47.2	47.9	48.0	48.0	48.0	48.0	47.9	47.9	46.1	44.2	43.7	43.5	47.7	50.0	50.4	50.4	47.1	47.0	47.7	47.0	46.8	46.6	46.9	46.9
25th	47.0	45.1	47.4	47.0	46.9	47.1	48.0	47.5	47.9	47.0	45.3	44.8	45.0	46.9	49.1	50.5	50.0	47.8	47.1	47.0	47.0	46.0	46.9	47.2
26th	46.9	46.6	47.3	47.7	48.1	48.0	48.0	48.3	48.9	47.1	46.0	45.0	45.3	46.8	49.2	51.5	53.6	54.1	53.0	51.5	50.0	48.6	46.0	44.0
27th	41.9	47.4	46.3	46.2	44.0	45.1	46.9	47.0	46.3	50.2	47.4	46.8	46.6	47.7	48.8	49.2	48.8	48.0	47.1	47.8	47.1	46.5	46.9	47.0
28th	47.0	47.0	47.0	47.0	47.0	47.0	47.0	48.0	47.5	48.3	45.9	45.9	45.8	49.2	51.0	52.0	52.3	50.1	50.0	47.1	48.4	45.9	44.3	44.2
29th	41.1	44.0	44.9	46.0	47.0	47.1	46.5	47.7	48.0	46.2	44.8	43.0	44.3	47.4	50.0	52.9	52.6	51.3	52.0	49.1	46.8	46.0	46.0	44.1
30th	42.9	43.9	45.6	46.4	47.6	47.4	48.1	49.0	48.2	48.3	46.3	44.4	44.8	47.6	52.7	53.0	53.0	56.6	49.6	48.3	44.7	41.1	45.7	43.9
31st	46.0	43.1	43.0	47.9	50.0	48.1	57.2	50.0	50.9	50.2	49.9	46.3	47.0	50.0	49.5	51.0	51.0	48.0	48.7	47.1	45.3	47.0	42.2	46.0
Means	45.22	45.32	46.10	47.00	47.43	48.00	48.11	48.16	48.08	47.72	46.11	45.32	45.89	47.60	49.15	50.50	49.91	48.57	47.84	47.33	46.50	46.12	45.44	45.63
Normals	45.85	46.07	46.37	47.30	47.43	47.47	46.95	47.77	47.63	47.25	45.83	45.32	45.89	47.60	49.15	50.50	49.91	48.09	47.33	47.49	46.54	46.52	45.90	45.63

MAGNETIC DECLINATION DURING THE MONTH OF AUGUST 1858.

Value of part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	46.0	47.0	47.3	48.5	48.2	48.0	47.8	47.6	49.1	48.1	45.9	41.0	43.9	45.6	47.9	48.0	49.9	48.0	46.0	47.0	47.1	45.9	43.0	45.0
2d	46.3	47.1	50.0	48.2	48.2	49.3	47.1	48.1	49.0	48.2	46.0	44.9	44.9	47.2	47.3	51.6	47.9	49.1	44.0	46.5	45.6	44.1	45.4	46.6
3d	47.0	46.7	47.2	48.3	48.1	48.9	48.9	48.5	48.7	47.4	45.5	44.9	45.0	46.0	48.5	51.0	50.4	49.2	47.1	48.4	47.4	47.0	47.2	46.5
4th	46.0	46.9	47.8	47.9	48.0	47.9	47.5	48.3	47.3	45.3	44.4	44.8	46.2	48.3	50.9	52.7	52.1	50.0	48.2	47.6	48.0	42.6	46.6	46.8
5th	47.5	47.0	48.0	48.0	48.0	48.8	48.0	47.7	47.2	46.1	45.9	45.5	46.0	46.7	50.0	51.2	50.9	50.0	47.5	46.4	47.0	47.0	47.1	47.0
6th	47.2	47.2	47.5	47.3	48.4	47.7	47.3	47.6	47.0	45.2	44.4	43.1	43.2	47.0	50.0	51.8	50.6	48.5	48.0	48.4	44.0	45.1	47.0	47.0
7th	46.7	46.7	45.9	48.7	52.0	48.2	49.5	48.9	49.0	47.0	46.7	45.2	44.9	47.3	49.9	51.2	50.0	48.7	47.4	47.1	47.3	47.2	47.6	47.5
8th	48.0	48.2	48.1	48.4	48.1	48.2	48.0	48.0	47.5	45.4	44.1	44.1	45.8	48.0	50.7	51.5	50.8	48.1	47.2	47.9	47.0	48.1	47.1	47.7
9th	48.0	48.0	48.0	48.0	48.0	48.0	47.2	47.9	47.7	46.3	45.0	44.5	45.1	47.6	51.1	51.6	51.8	48.4	47.0	47.0	47.1	46.5	47.0	47.1
10th	47.0	47.0	47.5	47.0	47.3	47.3	47.5	47.6	47.3	45.3	44.2	45.5	46.2	49.2	51.7	51.4	51.5	51.8	51.0	48.8	47.3	47.0	45.9	42.0
11th	46.7	46.7	47.5	48.0	47.8	47.5	46.7	47.1	46.8	46.0	45.0	44.0	44.2	45.9	48.5	50.0	50.3	48.7	47.6	47.6	47.2	—	—	47.0
12th	47.1	47.8	47.6	47.5	47.7	46.9	47.9	48.2	48.0	45.8	42.2	42.1	44.2	47.2	50.0	57.6	51.7	49.8	48.3	49.2	49.5	48.1	42.5	46.9
13th	46.3	45.0	46.6	45.7	47.0	48.0	48.8	47.7	47.2	48.7	45.0	45.0	45.9	46.9	48.7	50.0	49.1	48.9	47.9	48.0	47.5	47.3	47.1	47.0
14th	45.0	46.7	46.8	46.1	46.0	47.1	46.6	47.7	49.8	46.9	45.7	41.7	46.8	48.0	52.0	51.8	51.0	48.9	48.0	48.4	48.2	47.3	47.1	47.5
15th	47.0	47.8	48.2	48.2	48.2	47.8	47.8	48.5	48.3	46.5	45.1	41.7	45.9	49.7	53.0	53.0	55.9	52.0	50.6	51.1	49.3	49.8	49.5	49.1
16th	48.4	49.1	50.0	50.6	50.8	50.7	50.3	51.2	51.3	50.0	47.8	46.0	47.0	48.9	50.8	50.9	51.0	49.2	48.9	49.7	50.8	50.5	50.8	50.3
17th	49.8	47.0	48.7	49.0	48.5	47.0	48.3	49.7	49.8	47.3	47.0	47.0	49.0	49.5	49.4	51.0	51.3	50.0	49.8	49.9	50.7	51.8	50.7	50.5
18th	51.3	52.3	53.0	53.0	54.0	52.7	52.6	52.6	51.7	49.7	48.2	47.3	47.6	49.2	51.1	51.7	52.0	50.1	51.5	51.1	50.0	50.9	51.0	50.4
19th	50.3	50.3	51.0	52.0	52.2	52.7	51.8	51.2	50.4	48.8	47.0	46.8	46.8	48.9	51.5	52.9	52.0	50.1	49.9	52.9	51.7	51.3	51.9	52.4
20th	52.1	52.7	52.6	52.5	54.7	53.2	53.0	52.4	51.3	48.7	47.0	46.3	48.2	50.0	50.5	51.0	50.3	49.8	50.0	50.3	50.8	51.0	51.0	51.0
21st	51.0	49.4	50.2	50.1	51.0	51.0	50.5	50.0	47.8	48.7	44.5	45.7	47.1	50.4	52.0	53.0	51.5	52.5	52.0	54.2	40.3	46.7	46.0	49.0
22d	46.6	—	48.0	50.0	47.7	51.5	49.0	50.4	48.0	49.5	45.2	45.9	47.0	49.4	51.1	51.8	52.3	50.8	49.9	50.0	50.8	49.8	49.3	49.1
23d	50.7	50.7	50.4	50.6	52.1	51.5	50.8	50.5	48.8	45.8	44.7	44.2	46.0	48.0	52.7	52.0	53.2	51.0	48.9	49.2	48.6	49.3	47.9	44.3
24th	44.9	47.8	48.9	48.5	48.0	49.1	48.9	48.9	48.6	45.9	44.2	44.1	45.2	46.6	51.2	53.0	53.0	52.0	50.8	51.6	50.8	51.3	50.7	—
25th	49.8	49.1	50.0	50.3	50.0	50.0	50.0	49.9	47.9	45.0	52.0	42.1	44.0	46.7	50.0	50.9	51.0	50.0	49.0	50.0	49.5	47.0	49.0	49.6
26th	47.3	48.1	48.0	49.2	47.2	48.7	47.9	48.6	45.7	44.0	42.6	49.7	49.7	53.8	53.0	50.0	53.3	50.0	48.0	47.6	47.3	47.9	48.0	48.5
27th	49.4	50.0	52.0	51.3	—	51.0	51.3	48.9	47.0	44.3	43.3	43.9	46.0	48.4	50.0	49.4	48.3	47.5	47.0	46.6	46.7	45.8	46.3	45.8
28th	41.4	47.0	46.0	48.1	50.0	48.5	48.1	50.0	49.5	47.0	46.0	47.2	48.0	49.2	50.1	50.1	50.2	48.0	47.0	46.2	45.5	45.6	45.8	44.7
29th	41.7	43.6	46.3	45.5	48.0	48.0	48.0	47.6	47.2	42.7	40.2	41.0	44.0	47.4	49.0	50.3	50.0	49.9	48.8	47.0	47.4	46.9	46.5	46.0
30th	46.0	46.6	46.6	47.0	47.2	47.8	47.7	46.7	48.1	40.1	39.8	40.1	44.0	48.7	—	52.1	51.0	49.0	47.5	46.9	45.0	46.6	45.5	46.0
31st	46.0	43.0	42.3	49.0	48.5	50.8	48.7	54.5	52.0	44.0	42.2	42.4	44.3	47.7	51.1	52.6	51.8	49.5	46.9	47.8	45.4	45.3	42.7	45.9
Means	47.37	47.78	48.32	48.79	49.03	49.16	48.84	49.11	48.55	46.38	45.06	44.73	45.88	48.18	50.46	51.32	51.17	49.66	48.44	48.72	47.77	47.69	47.44	47.47
Normals	47.48	47.57	48.37	48.79	48.65	49.16	48.84	48.92	48.55	46.59	45.17	44.72	45.88	47.99	50.46	51.11	51.01	49.66	48.59	48.54	48.01	47.87	47.81	47.49

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF SEPTEMBER 1858.

Value of a part of division 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	46.2	47.6	49.8	47.0	48.1	49.0	49.8	48.6	47.0	45.8	40.1	40.8	44.0	46.0	50.0	50.1	51.0	50.0	48.0	47.3	47.6	46.5	42.5	45.2
2d	47.0	47.8	43.0	42.8	44.0	46.0	49.9	48.0	45.8	42.9	43.5	43.9	45.2	49.0	50.0	54.2	53.6	46.3	48.9	47.5	43.1	47.0	46.5	46.3
3d	45.0	45.0	46.8	48.8	48.9	48.7	52.0	50.3	46.6	43.2	41.2	41.8	44.0	47.8	52.0	53.2	52.5	50.0	48.2	48.0	45.3	45.0	47.0	47.0
4th	46.8	46.9	47.3	47.4	47.9	47.8	49.1	48.3	46.0	43.1	41.0	40.2	43.1	46.5	50.0	50.0	49.6	48.1	48.1	47.5	48.6	49.2	49.7	48.8
5th	49.5	49.5	50.5	49.5	49.0	48.6	49.0	48.1	45.1	43.4	40.0	39.4	42.0	46.9	51.2	52.9	53.0	50.2	48.0	48.0	48.2	48.6	48.4	48.5
6th	48.0	47.8	49.0	48.1	48.1	48.0	48.0	47.4	45.7	44.0	42.4	42.2	45.0	49.5	52.2	52.2	50.9	49.1	48.1	48.1	48.0	48.5	48.5	48.4
7th	48.0	48.8	48.9	48.8	48.4	48.5	48.2	47.7	45.9	43.0	42.0	43.9	46.1	43.3	50.0	51.0	51.0	50.0	48.9	48.5	48.9	48.9	48.9	48.9
8th	49.2	49.5	49.6	49.3	49.0	47.8	49.7	45.4	45.0	42.8	42.8	42.1	47.5	53.6	55.0	53.1	52.7	52.5	50.8	46.6	47.4	47.1	47.9	47.4
9th	47.1	48.2	48.4	48.9	48.7	48.9	48.4	46.8	45.0	42.0	41.4	44.0	48.3	55.6	58.0	61.8	57.5	55.0	48.7	49.0	48.3	49.3	47.9	44.9
10th	48.0	50.9	51.1	51.0	51.0	51.0	50.0	48.8	45.2	42.5	40.7	43.0	47.5	50.5	53.0	53.0	50.0	48.8	48.0	46.2	47.1	45.0	46.2	46.1
11th	48.0	47.8	49.2	48.8	48.9	48.3	48.4	46.7	44.0	40.2	39.7	42.7	48.6	54.0	55.6	58.0	57.8	53.3	54.0	51.8	50.9	45.5	45.3	47.6
12th	45.3	48.0	51.2	50.8	53.5	51.9	52.7	50.0	47.1	44.7	41.1	42.4	45.0	48.3	52.2	53.8	52.8	51.1	49.3	50.4	52.3	49.0	43.2	44.1
13th	44.9	47.5	48.5	51.0	53.8	48.2	49.0	49.1	45.1	42.8	41.1	42.0	45.8	47.2	50.1	50.0	50.0	50.7	51.3	53.0	53.5	52.3	50.6	52.0
14th	50.0	51.1	52.0	51.5	51.9	51.4	51.2	49.0	46.9	44.0	42.3	44.0	47.7	52.0	52.9	54.0	54.0	50.9	50.0	50.1	50.4	50.2	52.0	51.0
15th	48.8	52.8	53.7	51.9	52.2	51.7	51.2	50.5	48.3	46.2	44.9	44.2	46.5	50.0	51.3	51.0	51.5	52.2	53.0	54.6	54.1	52.0	52.0	47.5
16th	53.0	52.9	52.3	52.1	52.7	52.5	51.8	50.2	47.8	42.9	43.8	45.4	46.1	50.0	51.9	51.0	50.0	49.1	49.9	50.7	51.6	52.0	50.9	51.1
17th	51.5	51.6	51.9	51.3	51.4	51.1	51.6	49.9	47.2	43.2	41.0	41.8	45.0	49.0	52.1	52.6	51.0	49.0	48.9	49.9	50.3	51.1	51.4	51.8
18th	52.0	52.0	52.0	52.0	52.0	52.0	51.5	50.1	47.0	42.2	40.9	43.1	47.2	50.8	52.5	51.2	50.3	49.0	48.0	48.4	49.1	49.0	49.0	49.0
19th	48.9	48.5	49.0	48.9	50.0	49.5	49.6	48.4	44.7	42.0	40.1	41.9	45.1	48.8	51.9	52.8	52.3	50.0	49.0	54.0	52.0	45.5	40.5	46.0
20th	42.5	48.1	48.2	47.9	47.0	47.2	47.3	46.5	43.6	42.0	41.8	43.8	47.3	50.0	51.7	50.5	49.1	49.8	48.0	45.0	41.9	28.1	38.8	45.0
21st	46.0	42.2	44.1	45.4	48.0	52.1	54.0	52.1	48.0	45.0	43.1	43.9	45.9	50.3	50.2	49.0	50.1	45.7	48.7	47.8	46.9	44.3	46.1	44.4
22d	43.0	47.0	48.6	45.0	45.0	46.3	48.0	46.8	43.7	42.6	42.9	44.3	47.8	49.2	51.1	50.0	52.8	50.9	48.0	49.0	43.5	46.4	47.1	47.0
23d	47.0	46.7	46.0	41.0	48.1	44.0	46.0	44.1	49.5	44.6	48.3	49.6	48.0	51.0	51.1	50.4	49.1	47.4	47.5	47.8	48.1	48.8	49.0	48.8
24th	48.3	48.2	48.4	48.3	48.1	47.5	46.7	45.0	42.2	40.0	41.0	43.1	47.8	52.1	54.6	53.9	51.8	51.1	48.0	38.6	44.4	—	—	43.0
25th	37.0	45.9	48.0	51.2	49.7	48.1	45.5	54.8	47.3	46.1	40.2	42.8	46.0	50.8	51.8	51.2	49.1	47.3	45.0	44.1	45.6	46.4	48.6	48.7
26th	48.0	50.0	48.1	49.3	50.0	50.0	47.3	45.0	43.1	39.4	39.9	42.7	47.3	51.7	53.9	52.5	46.0	49.0	47.0	47.9	33.0	46.9	47.0	48.0
27th	48.0	46.6	48.8	48.8	49.9	48.3	47.0	47.2	47.0	40.8	40.1	41.1	44.9	47.9	52.0	53.2	52.9	50.1	49.0	48.0	47.9	47.7	47.6	47.2
28th	47.7	47.8	47.9	47.8	47.2	47.2	46.8	45.0	42.8	40.7	41.0	44.4	48.2	51.7	53.5	53.8	52.3	49.0	48.3	48.2	48.1	48.0	47.5	47.1
29th	47.0	47.0	47.4	48.1	47.9	47.5	47.0	44.9	42.7	39.8	40.9	43.5	46.9	50.9	53.0	52.5	50.9	49.0	49.0	48.9	49.0	48.8	48.5	48.0
30th	48.1	48.0	47.0	47.9	47.1	48.0	46.5	44.1	41.2	38.7	39.8	43.1	48.0	52.1	54.1	54.0	52.2	50.2	48.6	49.1	48.9	48.1	48.2	48.0
Means	47.33	48.39	48.89	48.67	49.25	48.91	49.11	47.96	45.55	42.69	41.63	43.04	46.26	50.05	52.30	52.56	51.59	49.83	48.77	48.47	47.80	47.42	47.48	47.56
Normals	47.69	48.29	49.11	49.15	49.27	49.08	48.94	47.72	45.55	42.69	41.40	42.81	46.26	49.86	51.90	52.04	51.35	49.65	48.44	48.39	48.17	47.63	47.96	47.56

MAGNETIC DECLINATION DURING THE MONTH OF OCTOBER 1858.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	47.8	48.6	48.6	48.7	49.0	49.1	46.6	44.0	42.1	39.1	40.7	43.2	47.4	50.8	54.0	53.2	52.2	50.0	50.2	49.1	49.0	48.9	43.0	45.3
2d	47.1	43.8	45.2	46.3	46.2	50.9	46.4	44.5	41.9	37.0	37.8	41.1	45.1	50.4	53.9	55.7	50.8	47.7	47.7	48.1	48.3	48.5	44.1	43.1
3d	44.0	48.9	48.5	48.1	45.5	46.2	45.8	43.0	40.3	34.0	39.8	44.3	48.8	53.0	54.3	54.1	51.2	51.8	46.5	47.5	41.9	44.9	46.3	44.9
4th	42.0	43.3	45.0	48.1	47.6	46.0	45.1	43.0	40.4	40.3	43.1	50.9	47.1	53.2	53.0	52.0	49.3	48.0	47.9	47.2	47.0	46.9	46.9	41.2
5th	43.1	46.5	46.9	46.8	46.8	46.6	45.3	43.3	39.7	37.2	39.0	42.8	49.1	52.2	55.4	54.8	51.0	48.5	47.3	47.0	47.0	47.1	47.5	47.1
6th	47.3	46.8	47.7	47.9	47.9	47.1	47.0	44.1	41.0	39.0	40.9	43.9	49.1	53.2	55.9	54.8	52.3	49.0	41.0	47.0	47.5	44.7	42.2	41.5
7th	39.7	36.8	42.1	44.0	45.0	46.5	45.0	42.0	37.7	37.7	38.0	41.9	47.0	48.4	52.0	53.0	51.0	49.6	47.0	46.1	46.0	45.0	39.9	40.0
8th	42.8	43.0	43.8	44.9	44.0	45.0	44.2	39.9	37.3	36.4	37.7	42.7	47.9	51.8	53.3	52.8	51.1	48.8	48.0	47.2	47.5	46.3	47.3	46.0
9th	45.8	44.4	42.2	41.8	44.9	47.6	46.1	42.6	40.1	39.1	41.0	45.8	52.6	53.1	55.7	56.0	54.1	51.2	49.8	49.2	47.6	46.4	39.7	43.3
10th	43.8	42.8	44.9	42.3	41.7	43.0	40.8	36.0	36.5	37.0	42.0	47.0	53.0	56.8	56.8	56.0	51.0	49.2	47.0	47.5	47.8	48.0	46.8	47.1
11th	46.9	46.8	46.5	46.0	46.1	45.0	43.0	41.4	41.5	41.0	42.2	49.4	54.8	58.0	57.5	56.0	51.9	48.8	47.9	43.2	47.0	47.0	47.5	47.0
12th	46.0	46.0	46.5	47.2	47.0	46.0	45.0	41.3	37.9	36.3	38.2	43.1	47.9	51.0	52.2	52.2	51.0	48.9	47.3	47.5	48.0	47.6	47.1	47.0
13th	46.4	46.0	44.2	43.9	48.8	45.8	43.8	42.0	38.0	36.1	38.5	43.7	48.3	52.4	53.9	53.4	50.7	48.1	46.6	46.5	47.0	46.5	45.0	42.7
14th	44.3	44.2	46.0	45.8	46.2	44.0	43.7	40.9	38.9	38.8	41.0	44.6	48.9	51.7	53.7	53.0	50.9	48.0	46.6	46.1	46.2	45.9	46.2	46.4
15th	46.0	45.9	45.9	45.8	45.9	45.2	43.9	41.2	39.2	38.6	40.9	44.1	48.8	52.3	54.1	53.2	50.2	47.3	46.5	46.7	46.5	46.3	46.0	46.0
16th	45.2	45.2	45.1	45.0	44.9	44.8	43.3	42.0	38.9	38.2	41.1	44.8	51.8	54.9	56.0	54.0	50.0	47.4	46.9	46.8	46.2	46.0	45.4	45.5
17th	45.5	45.7	45.0	44.7	47.0	45.4	43.0	40.3	39.2	38.5	43.0	47.2	52.9	55.2	54.2	54.0	49.5	47.7	45.8	45.9	46.0	46.0	46.0	45.2
18th	44.2	45.0	44.5	44.2	46.5	41.9	50.5	40.9	38.1	36.4	42.8	47.0	48.8	52.0	53.3	52.0	49.5	47.1	45.9	46.3	46.2	46.1	45.2	47.8
19th	45.4	44.0	44.8	45.0	44.8	45.0	43.1	41.7	40.1	41.3	47.0	44.1	49.1	51.2	51.5	51.0	46.8	45.0	42.1	37.0	43.9	43.5	43.1	42.5
20th	41.5	42.0	41.1	40.6	44.4	45.6	50.7	52.0	46.9	41.9	42.0	47.0	50.5	53.0	53.0	50.7	48.2	45.1	44.4	45.0	45.1	45.0	44.9	44.0
21st	44.0	44.0	45.0	46.0	46.0	45.0	46.3	42.5	39.0	33.7	35.7	41.7	48.2	52.0	55.0	54.0	51.1	48.8	47.1	45.5	46.9	45.6	38.8	42.2
22d	40.8	40.7	42.1	43.4	44.3	45.0	42.0	42.5	36.9	35.8	39.7	44.1	49.8	53.9	55.8	56.0	53.8	49.7	46.8	45.1	45.0	43.5	36.2	44.2
23d	45.0	44.8	45.0	45.1	45.7	46.0	44.0	40.2	36.1	35.0	36.1	41.8	47.0	54.0	56.0	55.0	52.4	48.6	45.5	45.8	41.1	43.9	45.2	45.5
24th	45.2	44.5	44.8	45.1	46.0	45.9	44.6	41.5	37.1	33.1	40.0	46.9	51.9	56.0	57.9	56.0	51.4	47.0	44.5	45.0	45.5	45.0	45.3	45.2
25th	45.4	45.6	45.3	46.6	45.4	44.3	42.7	38.3	36.0	34.7	36.2	42.7	50.6	54.7	55.1	54.0	50.9	48.0	45.6	45.1	45.9	45.8	45.4	45.2
26th	45.2	46.0	47.2	45.5	45.0	44.3	42.0	39.8	37.9	35.2	36.1	39.9	43.0	48.8	51.5	52.3	50.9	49.3	47.5	47.1	46.5	46.0	45.5	43.4
27th	42.5	43.1	44.4	46.8	42.2	42.1	41.9	37.9	36.9	35.9	38.8	45.1	51.0	54.9	54.1	55.1	54.8	52.6	51.0	45.0	42.2	41.9	43.0	42.9
28th	44.0	44.9	44.7	44.0	44.6	43.2	40.6	40.2	37.5	37.5	30.1	47.7	51.0	54.1	56.7	55.1	48.4	48.9	49.9	50.0	46.9	45.9	45.8	45.9
29th	46.1	45.8	45.2	46.2	45.3	44.0	42.7	40.2	38.3	38.5	39.8	44.1	47.5	48.8	50.0	49.1	49.0	48.6	43.3	46.2	46.5	44.4	40.0	42.0
30th	43.9	44.8	44.5	49.1	43.8	44.0	46.1	41.0	39.2	38.0	38.0	42.1	47.1	50.9	50.6	50.0	49.1	49.1	44.0	46.1	38.4	43.1	43.1	43.0
31st	44.0	44.0	43.3	44.2	44.9	44.0	43.0	40.3	38.9	37.4	39.0	43.1	46.7	48.8	52.0	53.1	49.1	47.4	46.1	44.7	43.3	45.9	45.5	45.2
Means	44.55	44.64	45.03	45.46	45.59	45.31	44.46	41.63	39.02	37.38	39.55	44.32	49.24	52.63	54.14	53.60	50.76	48.55	46.57	46.21	45.80	45.73	44.32	44.30
Normals	44.71	44.90	45.03	45.62	45.59	45.12	44.03	41.47	38.76	37.23	39.62	44.06	50.13	52.45	54.14	53.75	50.76	48.55	46.77	46.52	46.22	45.73	45.36	44.30

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF NOVEMBER 1858.

Value of a part of division 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	43.0	44.9	45.3	44.6	44.1	43.8	47.8	42.4	42.1	37.9	40.2	46.6	52.0	55.1	56.9	55.0	50.0	47.8	46.2	46.7	47.2	41.9	44.2	40.5
2d	38.1	40.9	41.7	43.1	45.4	42.3	38.1	36.0	37.6	40.6	44.5	48.5	52.4	54.6	53.5	51.5	48.9	46.8	42.1	41.9	44.2	44.3	43.0	41.1
3d	41.9	46.0	44.6	43.7	44.5	43.8	42.1	40.0	38.3	33.3	41.6	46.0	49.8	52.9	53.7	52.1	49.4	48.0	46.8	46.0	44.3	43.7	42.0	41.9
4th	42.0	42.3	42.5	42.1	42.0	41.1	40.0	39.0	35.9	36.7	40.9	46.8	51.8	54.1	53.7	52.1	49.1	47.5	46.0	45.8	45.6	45.0	45.0	44.0
5th	44.5	45.0	44.8	46.1	45.1	44.2	43.0	40.9	39.1	38.2	39.5	44.0	48.8	51.9	52.9	51.4	49.3	48.0	46.3	46.0	46.0	45.0	44.7	44.0
6th	43.5	44.5	45.0	44.9	44.3	43.5	41.3	39.0	37.9	38.1	41.6	44.7	49.0	51.8	51.0	49.5	47.6	46.1	45.1	45.1	45.7	46.0	46.0	46.0
7th	46.0	45.7	45.9	45.6	45.9	45.0	44.1	40.4	38.9	38.8	42.4	46.7	52.0	55.0	55.0	52.1	49.2	47.0	45.9	46.1	45.7	45.0	45.8	45.0
8th	45.1	45.7	45.6	45.6	45.3	45.0	42.1	40.1	38.9	40.0	41.4	45.9	49.1	51.0	51.5	50.0	47.0	45.1	45.0	45.7	45.8	45.2	45.2	45.5
9th	45.2	45.0	44.9	45.0	45.0	43.8	40.8	39.0	37.1	37.8	41.2	46.7	50.0	52.1	52.1	50.0	48.0	46.3	45.0	45.0	45.5	45.9	45.3	45.6
10th	45.0	45.0	46.0	44.2	45.0	44.0	41.7	39.0	37.7	37.0	42.0	46.0	51.0	53.6	54.0	51.8	48.9	46.4	45.0	45.2	45.5	45.0	45.6	45.9
11th	45.9	44.0	45.4	45.9	46.1	46.2	42.7	39.0	36.6	37.1	39.5	44.9	52.0	57.1	58.5	56.1	51.0	48.2	45.8	46.0	45.9	45.5	45.2	45.0
12th	44.5	44.9	45.4	46.8	46.0	44.3	41.9	39.9	38.5	37.6	39.9	45.0	48.8	52.9	53.2	52.2	51.6	49.5	48.9	48.1	47.3	47.9	45.3	42.6
13th	43.8	44.0	45.0	44.9	44.9	44.2	42.0	39.0	37.7	36.6	40.1	44.2	48.8	51.7	53.9	54.0	53.1	50.9	48.9	48.4	43.1	47.0	45.9	46.4
14th	46.0	42.8	46.9	46.9	47.0	48.8	50.8	48.0	42.7	39.1	40.9	43.6	45.1	48.1	50.2	51.1	49.9	48.3	47.4	46.5	46.9	48.9	48.0	48.0
15th	45.7	46.7	45.4	47.0	48.6	47.3	45.8	42.3	38.9	38.5	41.6	46.0	49.1	54.0	56.2	55.1	54.1	52.0	50.7	50.5	49.0	46.9	45.4	43.0
16th	44.0	45.7	47.1	45.2	47.3	46.1	42.3	41.3	38.0	45.0	42.9	47.0	51.2	53.8	55.3	55.2	53.5	49.0	47.6	48.4	50.0	49.9	47.1	46.5
17th	48.3	49.0	49.0	49.0	53.9	49.3	46.8	44.0	41.9	40.9	44.0	50.2	55.7	58.5	58.0	55.1	53.1	51.9	51.6	51.7	53.2	52.6	52.0	51.6
18th	51.0	50.9	50.2	48.9	48.0	47.0	45.8	42.7	40.4	38.1	40.0	45.2	49.9	52.2	52.8	52.8	51.1	49.3	49.2	48.0	48.8	49.2	48.0	46.7
19th	45.0	46.6	45.1	46.8	47.0	46.0	43.8	40.4	37.8	35.8	38.0	42.0	46.1	52.0	52.9	52.8	53.5	51.8	45.1	45.0	43.0	44.1	44.0	44.0
20th	39.0	39.1	43.0	40.5	43.1	43.5	43.2	38.1	36.9	3.8	44.3	49.0	51.8	53.1	53.1	52.2	50.9	46.2	46.5	47.0	48.0	46.1	46.9	47.0
21st	46.7	45.9	44.7	44.3	43.9	42.1	42.3	37.7	35.5	36.5	40.4	47.3	53.6	57.1	55.7	51.7	48.7	46.1	45.0	44.9	46.7	45.8	45.1	44.8
22d	45.0	45.0	44.5	44.8	44.8	43.0	40.5	37.3	35.2	36.1	40.0	47.9	54.0	58.0	58.0	54.0	50.2	47.1	45.8	43.9	42.0	41.7	40.1	42.5
23d	44.0	44.3	44.5	45.9	44.0	42.0	39.0	35.8	33.7	33.5	37.2	44.8	51.8	55.0	56.1	54.0	51.0	48.0	46.0	45.1	45.0	45.6	45.0	45.0
24th	43.7	44.2	44.0	44.6	44.5	42.5	41.0	36.9	33.9	34.0	37.2	42.9	49.4	54.0	54.4	51.9	48.9	47.0	46.0	45.9	45.9	45.1	45.0	44.0
25th	43.7	44.4	44.5	45.0	43.1	42.7	40.0	36.9	32.2	33.1	36.1	42.8	48.1	52.2	54.1	52.9	51.0	48.2	46.0	45.8	45.9	45.1	45.0	41.8
26th	41.0	41.4	43.0	43.9	43.3	41.1	38.0	35.7	33.0	34.0	38.0	43.0	47.8	52.8	55.8	54.0	49.8	48.9	46.9	45.2	46.1	45.1	44.1	37.0
27th	41.4	41.1	40.0	41.3	42.8	40.0	43.1	39.8	34.6	33.9	36.0	42.6	45.2	50.0	54.0	54.0	52.1	50.0	44.8	39.0	44.0	—	44.0	42.0
28th	43.1	40.3	39.8	40.1	41.6	43.2	41.8	39.0	36.0	36.4	38.1	42.0	45.3	48.5	51.0	52.0	50.8	48.6	47.4	47.1	46.1	44.4	44.4	44.6
29th	43.8	43.8	42.7	44.0	43.5	42.6	40.9	39.0	38.9	38.0	40.0	44.3	46.2	48.4	49.4	48.8	48.5	48.0	47.2	47.0	45.0	46.5	46.0	46.0
30th	43.3	44.5	45.1	44.6	44.0	42.8	40.2	38.7	38.2	38.8	41.9	47.0	48.7	51.0	51.0	48.9	47.0	47.6	48.1	48.9	48.7	48.2	47.8	47.5
Means	44.11	44.45	44.72	44.84	45.13	44.04	42.43	39.58	37.54	37.54	40.38	45.45	49.82	53.08	53.93	52.48	50.24	48.19	46.61	46.18	46.37	45.95	45.53	44.52
Normals	44.26	44.24	44.87	45.01	44.83	43.68	41.90	39.12	37.37	37.43	40.53	45.29	50.12	53.24	53.93	52.48	50.24	48.19	46.59	46.23	46.28	45.71	45.50	44.53

MAGNETIC DECLINATION DURING THE MONTH OF DECEMBER 1858.

Value of a part of division 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4 h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	47.3	47.0	46.9	46.5	46.0	44.7	42.8	39.9	38.3	37.7	42.7	47.2	57.7	54.3	55.2	52.8	47.0	47.0	46.0	47.0	46.9	47.4	47.8	47.3
2d	46.7	46.0	46.0	46.0	45.9	43.8	43.0	37.8	35.0	35.0	40.0	45.3	50.7	54.1	53.8	52.0	48.7	46.2	45.9	45.6	47.8	—	—	—
3d	46.0	46.8	46.9	45.2	45.0	45.0	41.9	40.2	37.7	38.7	44.0	50.3	54.8	56.4	55.5	53.7	51.4	49.1	47.0	47.0	47.0	40.1	43.5	
4th	44.5	46.5	45.8	47.0	50.0	45.2	42.9	40.8	38.7	37.0	39.0	44.1	49.8	52.8	53.6	51.7	47.1	47.2	46.5	46.3	46.5	45.8	45.0	46.0
5th	46.1	46.0	45.5	45.1	44.5	44.5	48.8	43.4	39.0	47.5	43.4	47.1	52.5	60.6	58.7	58.7	55.0	53.7	47.5	44.5	35.0	40.0	41.1	38.3
6th	38.0	37.7	38.2	39.0	39.7	39.2	36.0	35.0	34.0	36.9	40.2	46.2	49.5	51.7	53.7	52.6	50.6	48.0	—	46.3	45.5	45.0	44.5	44.2
7th	43.8	44.5	45.0	43.1	43.2	43.8	42.3	41.1	39.6	38.2	39.0	43.8	49.9	53.5	53.3	52.0	49.2	47.0	45.7	45.1	45.0	45.0	44.1	44.0
8th	43.5	43.6	44.3	44.5	44.0	43.4	42.2	39.2	36.3	35.4	40.0	47.2	53.0	56.0	55.0	54.5	52.1	49.8	47.2	47.0	46.4	45.1	45.5	45.8
9th	45.5	45.3	45.0	45.0	44.7	44.1	42.3	39.9	36.8	36.7	39.9	45.0	49.5	50.8	51.2	51.5	51.1	48.7	47.6	47.0	46.9	46.8	46.6	46.0
10th	45.7	45.6	45.5	45.2	45.5	44.0	43.2	39.9	36.9	35.0	38.0	42.9	49.0	53.0	54.8	54.5	52.1	49.0	46.9	45.5	44.0	45.0	44.1	44.0
11th	43.9	43.5	—	—	—	—	43.1	39.9	38.0	38.8	38.9	41.7	45.2	49.5	52.0	51.7	50.9	48.8	47.0	46.0	46.0	45.0	42.0	40.2
12th	40.0	39.0	41.2	40.1	41.3	43.0	40.1	38.0	33.8	35.9	37.9	43.9	48.1	52.1	54.2	54.0	53.1	50.8	48.0	47.2	47.7	46.8	47.0	45.2
13th	39.7	43.3	44.0	44.0	45.0	42.8	41.7	39.2	39.6	37.3	39.4	44.0	46.8	49.9	52.8	51.7	52.0	50.6	46.9	49.0	49.5	50.1	49.3	45.0
14th	44.0	43.9	42.2	43.0	41.1	43.0	47.9	43.0	39.8	39.1	42.4	45.7	48.9	51.8	53.8	52.6	52.6	49.0	46.1	46.1	45.2	41.1	43.0	41.2
15th	42.8	44.0	43.8	43.9	43.9	42.1	39.0	36.2	35.0	34.3	38.1	41.0	44.9	49.5	50.0	50.0	51.0	50.2	48.8	48.1	47.0	47.5	46.0	46.2
16th	46.5	45.2	44.5	45.9	45.3	43.6	41.8	38.8	36.0	36.0	38.9	42.8	45.9	49.5	52.1	52.1	50.0	48.8	49.9	48.6	49.0	48.5	47.1	47.1
17th	47.0	47.9	47.0	47.4	47.8	47.1	45.1	41.7	37.9	35.5	39.2	43.1	48.0	52.0	53.5	51.3	49.0	47.2	47.6	48.0	48.2	46.2	46.2	46.7
18th	46.3	46.1	45.0	44.7	43.6	43.1	40.5	36.0	33.2	31.6	41.4	46.7	51.0	54.8	57.3	56.1	52.6	50.5	51.2	50.0	49.0	40.6	47.5	48.7
19th	47.9	47.5	47.5	46.2	46.0	45.0	43.2	40.3	40.0	40.3	41.8	47.0	54.1	56.0	56.1	56.2	53.6	51.7	50.2	50.4	51.0	50.9	50.0	50.4
20th	50.0	50.6	51.7	51.9	51.3	50.0	46.7	43.9	41.3	42.3	47.2	52.6	57.9	61.0	60.4	57.9	55.0	53.2	53.0	53.9	55.0	55.5	55.9	55.4
21st	55.0	55.0	54.9	55.1	54.1	52.7	49.3	47.0	44.9	45.7	49.1	52.7	57.0	59.4	60.7	60.8	60.0	58.0	57.4	56.9	57.1	56.5	56.7	55.3
22d	56.3	55.8	55.3	55.1	54.5	54.0	52.5	48.3	43.6	42.0	47.0	53.0	56.7	59.5	58.0	57.1	56.8	55.2	54.0	54.0	56.0	56.5	54.9	53.5
23d	53.9	53.0	54.0	53.7	54.0	53.8	49.0	47.0	42.7	43.4	—	—	—	—	—	—	—	—	—	60.0	60.2	56.3	51.0	56.0
24th	54.5	53.5	51.4	53.0	56.1	53.8	53.3	50.0	45.0	42.0	40.8	—	—	—	—	—	—	—	—	—	57.1	55.8	56.6	54.5
25th	42.5	47.8	48.5	50.6	55.7	56.8	53.6	51.6	48.7	47.0	49.4	53.5	58.1	62.0	62.3	61.3	60.1	59.8	60.4	60.8	60.8	60.6	57.8	56.8
26th	57.9	58.1	59.7	57.6	56.8	56.5	55.1	—	50.7	47.8	47.0	49.8	52.8	54.8	56.8	55.8	56.7	54.8	53.6	52.6	52.3	51.9	51.9	51.5
27th	54.9	56.6	56.8	55.7	56.1	55.7	54.6	—	—	47.3	47.8	50.4	51.8	53.1	54.1	56.0	57.3	56.6	53.9	50.9	50.6	51.1	50.9	50.8
28th	50.8	50.7	50.6	50.8	52.4	52.9	52.7	50.5	48.6	46.9	46.9	47.8	49.8	52.4	54.1	54.7	54.0	54.7	54.3	53.8	53.7	54.9	55.2	54.9
29th	54.1	53.4	53.8	53.8	53.3	52.0	49.4	46.4	42.8	40.7	42.1	44.3	45.8	49.8	51.9	53.2	52.3	52.4	51.3	51.1	51.8	52.0	51.8	51.9
30th	52.2	52.5	52.8	51.4	52.8	51.6	50.7	47.5	42.8	42.4	42.8	45.0	47.0	48.7	48.8	47.0	46.8	46.8	48.4	47.9	47.8	47.9	48.4	48.8
31st	48.8	48.9	48.8	48.8	48.9	47.8	45.9	43.9	41.1	41.1	45.7	48.9	49.6	50.8	49.8	49.0	50.1	50.8	50.6	49.8	48.8	47.6	47.1	46.6
Means	47.62	47.88	48.09	47.98	48.28	47.50	45.83	42.29	39.93	39.85	42.33	46.66	50.89	54.13	54.60	53.88	52.35	50.88	50.10	49.80	49.34	48.86	48.64	48.08
Normals	45.73	45.95	46.14	45.69	45.89	45.11	43.52	40.94	39.44	39.10	40.57	46.02	50.33	52.55	54.41	53.57	51.74	49.53	48.15	47.85	47.99	47.79	47.80	46.64

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF JANUARY 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	45.8	45.8	45.5	46.8	45.7	44.7	43.7	41.8	39.3	35.1	30.6	26.4	50.7	54.9	54.9	55.0	53.8	51.7	49.2	48.8	48.0	47.6	47.1	46.8
2d	45.3	44.9	44.9	44.8	44.8	43.7	41.7	40.7	40.7	42.0	44.0	48.1	50.8	51.6	51.9	50.8	48.9	47.7	47.8	47.4	47.9	47.4	46.8	46.0
3d	45.8	44.9	45.6	45.2	44.7	43.7	42.9	40.8	39.3	38.9	42.0	46.4	51.0	53.0	52.7	51.8	50.0	49.6	49.3	48.9	48.9	48.8	48.8	47.8
4th	48.4	47.6	47.7	46.9	47.1	46.9	46.1	44.6	42.4	39.8	42.5	47.2	53.1	57.0	56.2	51.9	51.3	49.3	48.8	48.2	47.4	46.8	45.9	47.3
5th	47.3	47.8	47.9	48.1	49.8	46.8	45.6	41.6	36.4	33.5	37.9	42.9	50.1	54.1	54.9	(53.2)	(51.4)	(49.7)	47.9	47.1	47.5	47.5	47.2	46.9
6th	45.8	45.6	45.2	45.7	45.1	44.8	43.8	41.0	40.5	39.7	(42.9)	46.1	51.8	(51.8)	51.8	50.1	48.0	46.8	46.8	46.2	46.3	46.2	46.4	46.3
7th	46.0	45.8	45.8	45.0	45.6	45.6	44.0	42.0	38.1	34.6	36.7	(39.5)	42.3	54.0	57.6	58.1	55.9	52.3	49.9	49.0	48.7	48.8	47.8	48.8
8th	48.7	48.5	48.6	48.9	48.5	45.3	47.8	45.1	42.6	41.1	42.8	45.9	52.7	57.8	57.8	55.8	52.6	52.1	50.8	49.9	50.5	50.9	51.8	51.8
9th	51.7	51.9	52.1	51.5	52.1	51.0	49.1	46.8	40.9	38.8	39.0	44.6	50.2	54.3	56.5	56.7	54.7	53.8	53.8	53.8	52.9	54.3	53.7	53.2
10th	53.5	52.9	52.4	53.8	53.3	51.9	49.8	47.9	45.5	41.0	43.6	47.5	52.8	57.1	60.1	61.1	59.8	56.7	54.8	(53.2)	51.6	52.6	49.0	48.7
11th	45.6	42.8	44.9	47.8	48.0	47.3	47.6	44.9	39.2	45.7	46.6	49.9	54.4	56.9	58.8	60.1	59.8	57.8	54.7	53.8	52.8	51.8	47.6	51.7
12th	50.2	49.3	50.5	(50.3)	50.1	51.5	52.1	49.1	45.7	42.1	45.3	45.9	49.4	54.4	57.7	54.4	54.4	53.5	55.1	55.4	54.8	54.5	52.9	53.3
13th	50.4	51.5	53.1	53.1	53.6	52.6	50.9	48.6	45.6	44.6	46.8	50.6	42.9	55.3	57.8	58.5	57.8	56.4	54.0	52.2	50.0	49.8	53.6	53.8
14th	52.5	51.8	51.8	51.8	51.3	50.8	48.9	47.1	43.8	42.8	42.8	44.6	47.8	50.3	53.6	54.9	54.8	53.7	51.6	50.6	50.5	50.6	50.1	49.9
15th	49.8	49.8	49.8	49.9	49.9	49.8	48.8	45.9	42.8	41.2	42.8	45.5	46.8	49.6	50.8	51.5	52.9	50.7	50.0	49.8	46.8	42.8	44.8	43.9
16th	48.6	46.1	38.6	38.0	45.7	50.2	48.9	46.4	45.9	44.9	46.8	50.0	52.8	54.4	53.1	52.3	53.5	51.0	50.8	53.6	53.8	53.0	51.8	53.0
17th	52.8	52.7	52.7	50.8	50.7	47.6	47.8	46.5	46.5	46.0	47.9	50.0	42.9	55.7	55.0	54.6	56.7	54.4	53.5	53.3	54.0	53.8	54.2	52.8
18th	52.8	51.8	51.3	50.8	50.8	50.7	48.9	46.7	46.5	45.5	47.8	49.8	51.0	53.9	51.9	50.6	51.0	50.8	50.3	50.6	45.1	45.7	44.9	44.0
19th	43.3	43.8	44.7	43.5	42.9	43.8	41.5	41.6	39.1	40.8	53.9	49.0	54.2	54.7	54.1	53.7	53.8	53.0	51.9	50.8	49.8	48.6	41.9	47.8
20th	42.8	47.0	47.8	47.8	46.8	44.8	41.8	39.9	39.7	39.8	41.4	46.1	51.1	53.8	51.6	50.1	48.6	48.5	48.3	47.8	48.9	47.3	48.8	48.7
21st	48.5	48.8	48.9	49.4	48.6	47.8	44.9	41.5	38.0	38.5	43.7	50.8	55.0	58.6	56.9	53.7	50.8	48.9	47.7	48.7	48.8	46.3	44.1	47.8
22d	46.3	47.8	46.4	47.3	47.8	46.8	44.7	39.7	37.5	36.5	40.5	45.5	50.8	55.8	53.7	51.8	55.7	50.7	49.6	44.7	46.9	46.9	46.5	46.1
23d	46.0	46.6	46.8	47.2	47.4	46.7	44.0	41.9	36.4	34.1	37.2	43.8	51.8	56.6	55.8	52.5	49.9	49.6	49.6	50.0	50.4	49.9	49.2	48.9
24th	48.6	50.6	51.8	51.4	51.7	51.1	48.8	43.1	35.7	32.1	34.0	41.0	48.4	53.9	56.8	55.7	52.8	50.5	48.3	47.8	47.8	47.6	46.8	46.8
25th	46.5	46.7	47.0	47.6	47.8	47.1	45.6	41.9	37.9	36.7	39.7	45.0	51.6	56.8	58.0	55.8	48.5	48.6	50.8	52.8	52.8	51.9	51.5	51.5
26th	50.8	50.8	51.3	51.8	51.8	51.0	49.7	46.8	44.0	42.0	44.0	47.8	56.9	62.9	64.7	61.9	58.8	57.8	57.9	58.5	59.6	59.8	59.0	58.9
27th	59.1	59.1	59.3	59.0	59.8	61.7	58.2	54.1	52.1	49.0	49.6	52.6	54.8	57.8	61.8	61.3	61.4	62.2	61.8	59.7	57.8	57.8	56.9	58.8
28th	58.9	57.8	57.6	57.8	58.1	57.2	55.4	51.7	48.0	51.1	51.7	48.7	52.9	56.8	61.5	62.5	61.2	58.4	57.8	59.0	58.3	58.0	56.9	58.8
29th	57.4	56.8	55.8	55.8	55.3	54.8	54.4	52.4	49.2	46.9	47.0	52.3	57.2	58.8	59.7	55.9	55.8	55.6	55.5	55.1	54.9	54.0	54.0	54.8
30th	55.2	55.5	54.9	54.9	52.8	51.0	46.1	44.7	41.5	40.3	42.0	48.0	53.8	56.4	57.0	56.9	54.9	54.4	54.9	57.1	58.3	58.8	58.1	57.1
31st	56.8	56.3	56.3	56.1	55.6	54.9	54.1	49.8	45.9	43.8	47.0	51.1	56.6	58.7	57.4	55.8	53.8	48.3	46.8	52.8	53.8	54.8	54.8	54.8
Means	49.72	49.65	49.58	49.64	49.78	49.12	47.66	45.05	42.15	40.93	43.40	47.18	51.25	55.41	56.20	55.13	53.89	52.40	51.54	51.44	51.15	50.82	50.11	50.54
Normals	48.44	48.96	49.09	49.05	49.43	48.45	47.07	44.16	42.14	40.76	43.90	47.30	51.79	55.53	55.83	54.40	53.56	51.33	51.03	50.39	50.22	50.44	48.69	49.53

MAGNETIC DECLINATION DURING THE MONTH OF FEBRUARY 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	53.7	52.8	51.9	51.8	51.0	50.8	48.9	46.5	43.5	41.8	43.2	47.9	51.6	53.2	(54.0)	54.8	54.3	53.0	53.0	53.1	53.8	54.0	54.1	53.8
2d	53.8	53.7	53.6	53.7	53.5	53.1	51.6	49.0	44.0	40.6	40.3	48.9	55.8	58.6	60.1	58.6	54.9	51.8	50.2	51.0	52.3	51.9	54.8	55.0
3d	54.8	54.6	54.1	53.6	52.8	51.8	51.7	47.5	42.8	41.2	43.2	47.1	51.1	54.0	55.6	55.5	52.8	49.3	46.8	46.7	48.1	47.9	48.2	48.9
4th	49.3	49.5	50.1	50.4	51.1	51.3	49.1	45.1	40.0	36.3	39.9	46.8	50.9	54.8	58.3	58.3	55.5	51.6	48.7	48.6	49.8	49.6	48.2	50.1
5th	49.8	50.3	49.5	49.8	49.0	47.9	47.8	46.0	40.9	36.8	36.9	40.6	48.6	54.8	57.6	57.3	55.3	52.4	48.6	47.1	46.8	46.8	46.8	46.8
6th	48.7	47.3	46.7	47.9	49.2	49.6	45.3	42.1	37.9	36.1	36.1	46.1	55.1	60.6	60.9	57.8	53.8	49.8	47.3	46.0	46.0	46.0	46.5	46.0
7th	45.9	46.2	46.0	45.8	45.6	45.3	43.1	38.7	36.5	35.1	39.8	45.3	51.4	55.6	56.4	55.7	52.6	49.0	46.8	46.0	45.9	46.5	46.7	46.4
8th	47.1	46.7	46.5	46.8	46.1	46.0	44.1	41.2	38.8	36.7	38.8	45.1	50.0	53.9	55.0	55.6	54.7	53.2	51.7	49.5	49.3	48.0	48.1	46.0
9th	47.1	47.4	47.0	45.3	47.1	47.1	46.0	41.9	39.3	37.4	41.1	47.1	53.0	57.3	60.0	58.9	56.9	53.6	51.4	51.6	51.4	51.4	49.8	45.9
10th	46.4	43.1	(42.1)	41.1	44.8	47.7	41.0	43.1	45.2	42.7	47.2	52.3	56.2	60.2	63.8	61.1	60.5	56.8	53.0	45.9	52.2	49.1	52.1	51.0
11th	51.7	51.4	50.9	50.5	53.4	50.4	49.2	48.7	46.2	44.4	45.9	50.6	54.7	58.5	58.2	57.3	56.4	55.6	53.6	55.2	54.6	54.1	54.6	53.4
12th	52.4	50.3	52.4	52.7	52.4	51.4	51.8	49.1	46.7	45.4	46.3	50.6	55.4	59.4	61.4	60.3	57.7	54.4	52.4	53.2	53.2	53.4	53.4	50.6
13th	53.4	53.2	53.4	53.2	52.7	54.1	52.4	49.4	46.7	44.7	47.2	51.4	57.0	60.4	61.1	60.0	56.9	54.1	52.0	53.6	54.4	54.4	54.3	53.6
14th	52.3	52.3	52.4	52.4	53.1	53.3	51.7	49.0	45.6	41.7	41.6	45.8	52.4	58.4	60.8	60.5	59.2	56.2	53.3	53.9	54.7	54.4	53.4	52.5
15th	52.7	52.4	52.0	52.0	52.4	52.4	51.0	48.5	46.3	44.5	44.3	46.9	51.4	56.7	60.0	60.5	59.5	57.4	55.4	52.6	52.3	52.1	52.1	51.9
16th	51.5	50.4	50.6	51.0	48.2	51.2	51.7	47.1	48.7	49.4	49.7	55.4	59.6	63.1	63.5	63.5	59.9	57.7	54.9	53.4	52.5	52.9	52.4	48.5
17th	53.4	53.4	51.4	55.3	55.3	53.6	52.0	49.7	45.4	44.2	50.4	54.2	57.5	62.7	64.5	65.3	61.5	59.4	56.2	54.5	53.5	53.4	50.8	53.3
18th	53.2	53.4	54.3	54.2	53.2	53.2	53.2	49.2	45.0	42.5	43.3	48.7	54.1	58.5	61.1	59.4	57.2	54.7	52.5	50.9	51.5	51.9	44.8	49.2
19th	51.3	52.4	51.7	52.3	51.8	51.3	49.3	46.8	42.4	39.7	43.5	50.4	56.2	60.0	60.3	59.1	56.7	53.9	51.8	51.0	51.6	51.5	48.7	48.8
20th	50.4	50.4	50.2	50.4	49.4	49.6	48.2	45.3	43.2	43.2	45.3	48.4	52.1	55.0	57.4	57.6	56.4	55.5	54.1	52.3	52.1	52.3	51.5	51.2
21st	49.4	49.4	48.6	50.3	50.4	49.8	47.8	44.7	42.4	40.8	42.3	47.2	52.4	56.6	58.7	57.9	55.5	54.0	52.9	51.9	51.5	50.9	50.6	50.4
22d	50.3	48.7	50.0	50.2	50.3	50.2	48.5	44.3	41.2	39.7	40.8	44.8	49.9	54.1	57.5	58.4	56.4	54.5	53.4	52.4	52.4	52.4	51.9	51.4
23d	50.7	51.0	51.4	51.6	51.9	50.8	48.7	43.5	44.2	38.1	45.4	51.5	52.4	55.3	61.6	61.1	58.4	56.7	53.6	53.3	51.5	52.7	51.4	50.6
24th	47.4	44.8	43.9	45.5	44.6	49.3	46.5	43.9	45.4	52.7	49.5	51.4	55.5	58.3	60.4	58.6	57.9	56.6	55.6	54.4	52.7	49.7	46.1	36.9
25th	43.5	42.2	41.4	45.6	46.5	46.4	45.2	45.1	41.7	40.8	43.4	46.8	51.4	56.3	56.8	57.2	55.7	53.8	48.5	51.3	50.9	48.5	47.6	46.4
26th	46.4	46.4	48.4	49.2	50.4	51.1	48.7	45.7	43.1	41.7	44.5	49.7	55.2	59.4	60.6	59.4	57.2	54.2	53.3	52.7	52.8	47.4	44.6	40.9
27th	37.5	40.4	32.0	43.9	53.3	51.5	48.4	45.2	41.7	42.6	45.7	50.3	53.2	55.7	57.9	58.1	56.9	54.5	53.6	53.4	53.4	52.5	51.9	(47.8)
28th	43.8	45.8	49.5	50.5	49.6	49.3	46.8	45.7	42.9	42.6	45.4	50.6	55.7	59.5	61.0	59.6	57.2	53.4	52.7	52.4	52.4	52.2	51.5	51.2
Means	49.57	49.28	49.00	49.89	50.32	50.34	48.56	45.79	43.13	41.55	43.61	48.64	53.56	57.53	59.45	58.84	56.71	54.18	52.05	51.35	51.56	51.00	50.25	49.23
Normals	50.35	50.21	50.22	51.17	50.99	50.70	49.10	43.72	43.58	42.14	43.62	48.47	53.52	57.12	59.46	58.41	56.53	54.57	52.66	52.44	52.20	51.54	50.51	49.66

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF MARCH 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	50.7	50.7	50.3	50.3	50.2	49.9	49.7	46.0	44.2	43.7	43.9	51.7	56.5	55.5	57.3	56.6	54.3	51.9	50.5	51.5	52.0	52.5	52.2	62.4
2d	52.4	52.4	52.4	52.4	52.4	51.7	52.1	50.4	47.6	46.4	48.4	52.1	56.1	58.4	59.1	58.2	56.5	54.0	52.4	51.6	51.6	52.3	52.1	51.2
3d	50.3	49.7	51.7	51.5	51.9	50.9	49.4	47.4	45.0	44.5	46.3	51.4	57.2	60.5	61.2	59.2	57.6	55.3	53.6	53.5	52.1	5.3	51.4	52.0
4th	51.6	51.5	51.4	49.2	51.6	44.3	50.4	47.7	45.3	50.9	50.6	52.1	54.4	55.4	58.3	57.3	55.4	53.6	52.2	52.3	50.4	48.4	47.4	49.4
5th	49.8	47.0	43.3	48.9	50.1	51.4	49.4	49.6	47.3	47.1	47.4	50.3	53.2	55.0	56.5	54.8	53.3	51.5	51.0	51.0	50.1	50.4	50.4	49.5
6th	49.2	50.2	48.7	49.3	49.7	48.0	48.9	47.1	43.1	45.4	46.0	49.5	55.9	57.4	59.6	60.4	57.5	53.7	51.7	52.4	52.0	56.7	48.6	48.6
7th	50.4	49.9	49.9	49.4	49.4	49.2	47.7	45.4	43.3	42.4	54.4	49.7	56.6	61.1	62.3	61.5	58.8	54.5	52.2	51.5	52.1	50.7	50.7	50.3
8th	50.2	49.9	50.5	50.0	49.8	49.6	48.9	46.2	42.7	41.4	42.7	49.2	54.6	59.1	61.3	60.8	57.7	54.4	53.2	53.0	52.9	51.7	51.6	51.4
9th	51.4	51.4	50.7	51.2	51.1	50.6	49.7	46.4	43.6	41.3	42.8	47.1	54.9	60.9	61.6	60.6	59.0	(55.7)	52.5	51.2	52.7	51.4	51.2	50.6
10th	50.3	50.1	48.7	47.3	47.2	48.4	47.1	44.6	41.1	41.7	42.4	47.7	54.8	58.3	60.3	59.8	57.9	54.4	52.8	53.7	54.4	53.9	52.1	51.4
11th	51.4	50.4	51.3	50.3	50.0	48.8	49.3	47.1	48.4	43.2	49.5	51.5	55.2	58.1	58.5	58.1	56.1	54.0	53.2	53.4	54.2	52.4	52.8	51.4
12th	51.6	50.4	50.4	51.4	48.4	50.5	50.4	48.7	46.0	45.1	44.3	48.6	53.7	54.7	58.2	59.0	(57.5)	56.1	53.6	53.2	54.0	53.7	53.5	53.3
13th	51.3	50.3	51.7	51.3	51.3	51.4	51.4	49.6	47.3	44.9	49.6	51.5	56.3	59.7	61.3	60.9	59.9	57.4	55.4	55.5	55.4	55.5	54.4	54.4
14th	54.1	53.6	53.6	53.6	53.4	52.6	52.6	51.0	49.4	48.5	50.0	53.9	57.5	59.5	60.2	59.7	57.7	55.3	54.5	54.5	54.6	54.4	52.4	54.4
15th	53.2	52.5	52.3	53.3	53.0	52.5	53.5	51.3	50.3	49.4	49.5	52.2	55.5	57.6	58.9	57.9	56.6	55.7	55.5	54.2	54.4	54.1	53.4	49.9
16th	53.4	52.0	52.2	51.6	51.6	51.5	50.3	50.2	47.9	47.7	48.7	51.0	53.2	55.4	56.2	55.8	53.9	54.7	53.4	55.0	54.6	52.8	53.2	52.3
17th	51.4	51.4	49.4	47.4	49.3	46.9	49.5	49.8	49.1	44.1	47.7	50.5	56.1	58.3	59.7	57.2	55.4	53.6	52.7	51.7	52.1	53.5	51.1	52.6
18th	48.6	50.7	47.3	50.4	50.9	51.2	50.5	49.1	47.1	48.2	48.2	52.3	55.3	58.9	57.8	56.7	56.3	53.0	52.4	51.9	52.8	53.6	53.5	50.5
19th	49.3	46.8	48.6	48.3	47.2	49.3	48.4	46.4	47.7	46.2	45.9	48.9	42.4	46.7	58.4	56.5	55.2	53.6	52.3	51.4	50.4	50.4	50.4	50.6
20th	50.5	50.4	50.3	50.0	49.3	49.4	48.4	47.6	46.3	45.3	47.4	49.3	52.4	54.3	55.2	54.7	54.2	52.4	51.6	51.4	50.7	50.4	50.0	50.4
21st	49.4	49.3	49.3	48.3	48.9	48.4	47.4	46.4	45.0	44.8	46.9	51.0	55.3	58.3	58.8	57.8	55.4	53.0	52.4	50.3	50.3	49.4	44.8	49.7
22d	51.4	46.4	46.4	48.5	47.2	52.4	49.2	48.4	47.2	47.1	48.2	51.5	54.1	56.8	59.2	58.1	57.1	54.7	53.7	52.8	51.9	51.5	45.9	50.5
23d	50.1	50.3	50.4	50.6	51.2	53.5	49.7	49.0	46.7	45.1	45.8	48.1	52.4	56.5	59.2	58.5	56.5	53.8	52.4	52.1	53.6	53.5	46.0	51.4
24th	51.2	51.2	51.3	51.5	51.3	51.3	50.8	49.2	47.1	44.4	45.5	48.0	53.0	59.0	61.5	61.8	61.4	59.7	53.4	52.1	51.8	46.4	43.2	47.4
25th	45.5	47.3	47.4	46.5	51.0	50.2	49.6	46.3	44.3	45.7	45.2	47.4	50.6	53.4	55.2	56.4	53.7	52.6	51.4	51.4	50.2	48.4	42.0	46.4
26th	47.8	45.5	46.1	46.6	49.2	48.4	50.4	50.2	47.7	46.9	47.2	50.5	54.2	55.7	57.1	57.3	55.0	52.8	51.6	46.4	48.5	47.4	42.6	47.6
27th	44.4	45.4	43.8	44.3	43.4	46.4	47.4	45.4	48.3	49.4	50.2	51.3	53.6	53.7	53.4	54.2	53.4	49.5	50.4	50.7	48.4	48.1	48.9	41.6
28th	45.1	42.4	46.3	50.9	50.5	50.4	48.9	46.3	48.7	49.2	47.4	48.6	50.6	53.6	55.1	(54.3)	53.6	52.5	51.1	44.2	51.2	50.1	48.4	50.4
29th	48.8	52.5	50.1	56.9	49.6	48.9	48.4	49.9	49.1	47.7	46.5	49.4	52.0	53.4	54.9	53.9	52.8	52.8	52.4	51.4	50.0	50.4	46.2	47.9
30th	48.4	50.3	49.4	46.7	48.5	48.2	49.4	50.8	49.8	47.4	52.3	53.5	55.6	58.0	57.9	57.8	51.4	52.5	52.5	51.6	44.3	49.4	44.4	47.4
31st	43.7	40.6	43.5	49.1	48.2	45.3	49.3	47.3	44.8	44.6	47.2	50.2	54.7	58.0	55.6	56.6	53.4	50.6	50.4	56.4	43.7	45.4	48.6	49.5
Means	49.90	49.44	49.31	49.90	49.90	49.73	49.62	48.09	46.50	45.80	47.42	50.32	54.13	56.91	58.38	57.82	55.95	53.85	52.53	52.04	51.53	51.26	49.46	50.53
Normals	50.67	50.15	49.93	49.86	50.11	49.91	49.62	48.09	46.68	45.78	47.52	50.32	54.52	57.25	58.55	57.82	55.92	53.65	52.53	52.51	52.05	51.44	50.67	50.43

MAGNETIC DECLINATION DURING THE MONTH OF APRIL 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	48.4	47.2	46.4	47.4	48.7	52.3	50.8	50.6	44.7	45.8	45.3	49.9	54.5	56.1	56.3	56.0	53.9	50.9	50.4	42.4	45.5	48.6	47.8	45.7
2d	47.4	44.1	49.2	48.4	51.3	56.5	48.6	46.5	44.6	44.1	48.3	50.5	54.3	56.8	57.4	55.8	54.4	52.1	51.3	51.2	49.2	51.4	50.8	50.9
3d	50.6	49.5	50.6	49.4	49.2	52.9	50.1	47.6	45.4	45.2	46.9	51.1	55.5	57.0	57.4	57.5	56.2	54.0	52.4	51.5	50.5	50.5	50.5	50.5
4th	50.5	50.5	54.2	56.3	49.9	49.4	49.6	46.3	45.1	45.4	48.2	51.4	55.3	56.2	56.8	54.3	52.9	52.1	51.8	(50.7)	49.6	51.2	50.9	50.5
5th	50.3	50.2	51.1	50.4	49.8	49.9	48.9	47.1	45.3	44.7	46.5	50.5	54.4	57.3	58.7	58.5	55.5	53.9	48.9	50.3	50.1	50.3	49.5	50.2
6th	49.5	44.6	43.4	48.4	49.4	49.4	48.0	46.5	44.3	44.4	45.4	52.0	55.6	57.9	59.2	57.5	55.3	53.2	52.2	50.4	49.4	49.1	49.1	49.2
7th	49.1	48.9	43.4	48.2	48.6	48.1	47.2	45.2	43.7	44.4	43.9	52.2	58.1	56.3	57.6	58.4	58.5	53.4	51.4	50.5	49.2	48.5	48.5	48.6
8th	42.4	47.6	46.5	47.0	49.2	46.4	46.2	44.0	42.3	42.3	44.5	48.5	52.4	55.2	57.2	55.1	53.3	50.4	49.4	48.4	47.4	48.3	48.4	48.4
9th	47.4	47.3	43.3	47.4	48.4	48.0	47.5	46.2	44.5	42.6	44.4	41.4	55.4	58.5	59.5	57.4	56.5	53.2	52.5	50.2	48.2	48.0	48.2	47.9
10th	47.9	47.7	48.3	47.7	48.3	48.2	47.5	45.4	43.6	41.1	41.3	45.8	50.5	53.8	56.0	54.4	53.3	51.6	50.3	49.5	49.0	48.9	48.2	47.7
11th	46.6	47.4	47.4	47.7	47.4	47.4	46.4	46.1	44.5	43.3	43.4	46.1	49.8	52.4	53.4	52.1	50.8	50.4	49.6	49.7	49.3	48.5	47.5	47.5
12th	46.3	44.4	45.9	46.4	46.9	46.9	46.9	46.3	45.1	44.5	45.5	48.2	51.0	54.0	53.5	54.4	51.6	52.4	51.5	50.1	49.6	46.5	47.9	47.6
13th	47.3	47.7	47.4	47.8	47.4	46.4	45.7	45.3	44.9	47.6	48.9	(49.5)	(50.0)	50.6	53.5	53.3	50.7	50.5	49.3	48.4	48.2	48.2	45.5	41.4
14th	46.7	47.4	46.8	46.4	46.0	46.3	45.5	43.7	45.3	44.0	45.4	46.4	48.5	51.8	52.9	52.5	50.9	48.4	49.3	48.9	48.4	47.7	46.4	45.5
15th	43.5	43.2	49.4	46.9	46.7	46.4	46.4	45.9	44.7	43.8	43.5	46.1	50.4	52.5	54.2	52.7	50.9	49.4	48.7	48.1	47.5	47.4	47.4	46.8
16th	46.5	47.2	47.2	46.4	48.4	45.9	44.6	46.1	43.7	42.3	43.3	45.5	50.0	51.5	52.1	51.2	50.2	50.0	49.4	47.7	47.3	48.2	47.3	46.7
17th	46.4	46.4	44.9	45.5	45.9	46.0	45.5	44.4	43.5	43.6	45.1	47.9	50.3	52.6	52.1	50.7	49.3	48.5	47.5	47.2	46.9	46.8	46.7	45.9
18th	45.9	46.1	46.4	45.8	45.4	46.1	45.3	44.3	42.7	42.9	44.5	47.0	50.8	54.4	55.4	54.0	51.6	49.6	48.8	48.4	47.4	46.4	46.4	45.4
19th	44.4	43.9	45.4	44.4	45.6	45.6	45.4	44.3	43.4	43.3	44.1	46.2	49.5	52.5	53.8	(52.6)	51.4	49.4	49.4	47.6	49.3	47.4	45.6	45.8
20th	45.8	46.4	46.4	45.9	45.0	45.5	45.3	44.1	43.2	42.2	43.4	46.6	50.5	53.4	54.4	54.4	50.9	49.9	49.5	48.6	48.2	47.6	47.5	47.3
21st	46.5	46.5	46.5	46.5	46.4	46.3	45.4	44.9	43.7	42.8	43.9	45.7	49.9	52.3	52.3	(52.3)	52.4	50.4	49.3	48.1	47.8	47.1	44.9	44.0
22d	42.9	33.4	35.6	41.2	31.6	47.3	48.5	52.1	50.4	42.5	42.6	50.7	52.4	50.8	50.5	49.0	48.2	46.5	46.1	45.5	45.1	45.2	44.4	44.4
23d	44.4	44.6	45.3	45.4	43.6	43.1	44.7	47.8	41.2	40.3	40.4	44.9	49.2	50.6	53.6	52.2	50.3	49.2	45.9	43.5	43.5	43.4	43.8	42.4
24th	40.5	40.7	41.7	40.4	47.4	48.3	47.5	46.4	43.9	42.2	47.4	49.4	49.8	50.6	50.5	53.9	47.9	47.4	47.3	44.9	36.5	42.9	43.4	44.0
25th	41.7	44.5	45.2	44.7	45.2	45.3	44.3	43.7	44.5	44.4	42.5	45.5	48.4	51.8	52.9	52.2	51.6	47.5	39.4	46.1	45.5	42.4	40.9	44.3
26th	43.9	44.4	46.1	45.2	44.4	45.3	45.3	44.0	43.4	42.5	45.4	46.3	48.8	51.5	53.0	52.4	51.2	48.4	47.4	46.4	46.0	44.7	41.6	42.4
27th	43.5	44.0	45.8	44.9	44.3	45.0	47.4	44.3	43.4	41.4	41.8	44.7	47.4	50.5	50.8	51.2	48.4	46.4	45.6	44.6	43.9	43.4	43.4	43.4
28th	43.8	43.4	43.6	40.3	44.5	42.5	42.5	41.6	40.6	42.3	44.7	47.3	49.9	50.4	49.5	48.4	46.8	45.9	44.4	42.2	42.4	43.3	42.4	42.4
29th	43.5	42.9	42.5	42.0	43.9	44.1	43.5	42.7	41.7	39.1	43.2	48.3	47.3	48.9	50.6	51.1	49.7	48.4	45.4	45.3	38.4	37.9	38.2	39.4
30th	36.8	35.6	38.4	45.3	40.1	42.7	44.5	45.9	45.0	47.8	47.3	47.6	51.1	52.1	52.4	52.6	(53.9)	55.3	53.4	52.5	52.6	47.9	45.6	47.8
Means	45.68	45.26	45.81	46.12	46.30	47.12	46.50	45.64	44.08	43.37	44.62	47.65	51.28	53.33	54.28	53.64	52.00	50.32	49.00	48.03	47.07	46.92	46.35	46.13
Normals	45.67	45.89	45.78	46.91	46.89	46.65	46.50	45.24	43.86	43.37	44.62	47.71	50.34	52.98	53.74	53.46	51.44	50.15	49.33	48.23	47.78	46.89	46.73	46.38

FLAGSTAFF OBSERVATORY.

15

MAGNETIC DECLINATION DURING THE MONTH OF MAY 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	51.3	50.4	50.4	50.3	50.1	49.3	49.3	49.4	48.2	47.3	48.3	48.0	50.7	52.1	52.8	53.1	52.4	52.1	50.8	51.1	51.0	50.1	50.3	43.9
2d	47.8	49.7	49.3	49.4	48.9	48.8	48.8	48.4	47.3	46.6	47.7	50.8	52.9	54.2	55.4	55.4	51.9	51.5	51.3	49.5	48.7	48.4	49.0	48.0
3d	47.3	48.6	48.3	49.3	47.5	49.3	48.5	47.3	46.6	46.1	47.8	49.6	53.3	(53.2)	53.2	53.1	52.6	51.3	48.3	48.0	(48.4)	48.8	48.8	49.3
4th	46.5	48.6	46.3	51.0	49.5	48.6	48.3	47.6	46.1	43.7	46.5	48.3	51.3	54.3	55.4	54.0	54.7	51.9	49.0	48.0	48.1	48.3	48.3	47.6
5th	47.3	48.7	48.2	47.3	47.0	46.6	46.8	47.9	47.2	46.2	47.3	49.3	50.3	53.9	57.4	58.4	56.8	56.1	51.8	48.8	46.6	45.3	46.4	46.6
6th	46.4	46.3	46.3	45.3	44.4	45.1	45.2	44.3	42.6	43.8	46.4	49.4	51.4	52.8	54.1	54.3	51.3	49.3	47.1	48.3	47.3	47.4	46.6	46.4
7th	46.2	45.8	43.4	45.1	45.3	43.8	45.8	45.5	44.5	44.3	45.3	46.3	49.1	50.5	50.7	49.6	48.5	46.8	46.4	46.7	46.2	45.4	47.8	44.4
8th	43.3	43.0	42.1	43.2	43.6	43.0	43.0	42.5	41.6	41.6	41.0	45.1	46.5	47.8	48.3	50.0	46.7	47.2	(46.7)	46.3	46.4	46.3	46.0	45.3
9th	45.7	46.2	46.3	46.4	46.4	46.4	45.6	44.5	42.1	43.3	44.4	46.8	47.5	49.3	49.6	50.2	49.2	48.5	47.2	45.9	45.3	45.3	41.0	42.3
10th	44.3	44.4	41.9	44.7	43.7	43.0	42.1	43.3	42.4	42.3	42.3	44.1	45.2	46.4	48.3	49.7	49.3	47.5	45.8	44.5	43.5	43.1	42.5	42.4
11th	42.1	42.3	42.3	42.3	32.2	42.3	41.3	41.3	40.9	40.3	40.8	45.6	45.9	48.1	49.5	52.0	52.2	47.3	45.5	44.2	43.1	43.0	42.9	42.6
12th	43.1	42.8	42.8	43.2	43.3	43.4	43.4	43.5	43.2	41.3	42.2	42.1	43.4	45.4	46.4	47.3	46.3	44.3	42.6	43.0	40.4	40.5	40.5	37.4
13th	39.4	39.3	38.6	38.6	40.3	41.2	43.2	41.2	40.7	41.0	40.7	44.1	46.4	48.3	49.5	48.7	48.1	45.7	43.8	43.1	42.3	41.3	41.3	40.4
14th	39.4	38.9	40.8	39.6	39.2	40.2	39.7	39.5	39.2	38.7	39.4	41.3	44.1	45.4	46.7	45.7	45.4	42.8	42.4	41.3	41.3	41.3	41.3	41.8
15th	41.6	42.1	41.5	41.6	42.4	41.5	41.3	41.3	41.1	40.3	39.5	38.5	41.5	44.8	46.4	46.8	45.4	42.7	41.3	41.2	40.7	40.4	40.6	40.5
16th	40.3	39.9	40.5	41.3	41.3	41.3	41.3	41.5	42.0	40.3	41.4	42.4	44.8	47.1	48.1	(46.3)	(44.4)	(42.6)	40.8	40.6	40.4	40.6	40.6	40.6
17th	41.1	42.8	41.8	41.4	41.7	41.3	41.1	41.0	39.6	39.4	(40.7)	(42.0)	43.3	44.3	(43.6)	(42.8)	(42.1)	41.3	41.1	40.9	40.2	39.6	39.3	39.0
18th	39.3	40.3	41.0	41.3	41.9	41.8	41.6	41.1	40.5	40.8	(43.2)	(45.6)	(48.0)	50.4	(49.4)	48.4	47.3	46.5	43.4	42.3	42.4	41.5	42.3	42.3
19th	42.3	42.4	42.6	42.9	43.1	43.0	42.5	42.4	42.0	40.8	(41.3)	41.9	42.6	44.9	45.6	46.0	43.0	41.4	40.2	39.7	39.3	39.3	41.5	37.3
20th	45.9	37.9	33.8	39.5	36.6	36.8	39.3	40.2	40.3	38.6	(40.2)	(41.7)	43.3	44.4	45.2	(43.7)	(42.3)	(40.8)	39.3	39.4	38.5	39.3	39.6	39.4
21st	38.6	39.3	43.3	40.3	40.3	40.3	40.3	40.1	40.3	42.1	(43.1)	(44.0)	(45.0)	46.0	46.4	44.0	44.4	45.3	39.2	40.1	36.9	36.2	38.2	37.6
22d	38.2	38.6	39.5	38.6	38.6	37.8	38.3	37.5	37.5	38.4	38.5	42.2	45.1	44.3	46.2	45.1	42.7	40.2	38.4	37.3	37.3	35.3	35.3	35.3
23d	35.5	34.5	37.6	36.8	37.9	38.4	38.3	37.6	37.4	37.0	37.7	39.6	41.8	44.4	43.7	43.1	42.3	40.5	37.3	33.7	35.5	33.0	35.3	35.3
24th	35.5	35.2	35.1	34.6	35.6	36.1	35.1	34.0	33.5	33.3	35.7	38.8	41.7	44.0	44.9	44.0	41.8	39.4	36.3	35.3	34.4	33.6	33.4	32.7
25th	34.2	34.0	34.3	34.6	34.4	34.8	34.4	33.5	33.0	33.0	(36.0)	(39.1)	42.1	42.3	(41.4)	(40.5)	(39.6)	(38.7)	37.8	35.4	34.5	33.6	31.4	32.1
26th	33.3	34.3	35.3	36.3	36.6	36.3	36.3	35.5	34.8	34.5	36.3	39.3	41.8	43.2	44.0	42.8	41.3	41.3	40.4	39.3	38.6	38.1	38.1	38.0
27th	38.2	38.3	38.3	39.2	38.5	38.0	37.4	37.0	36.6	35.4	35.5	34.4	35.3	38.2	38.9	40.3	41.4	37.3	35.8	34.4	34.2	33.6	35.6	33.9
28th	33.1	33.3	34.0	34.7	34.8	34.4	34.5	33.6	33.0	32.8	34.4	36.2	38.9	41.8	40.9	(39.7)	(38.5)	37.3	35.3	34.3	33.3	33.1	32.3	32.3
29th	32.6	32.7	33.3	33.4	33.6	33.6	33.0	33.6	33.3	32.3	32.4	34.3	37.3	38.4	38.6	39.9	39.0	36.2	36.3	34.0	33.3	31.8	31.8	31.2
30th	31.6	27.0	31.5	35.5	31.0	29.5	30.6	30.3	29.6	31.1	—	—	—	52.1	54.1	55.2	54.3	(54.5)	54.7	49.1	51.0	50.0	49.1	49.6
31st	49.5	49.5	48.8	50.0	50.4	49.3	48.3	49.5	48.6	48.2	48.1	50.8	52.3	55.1	55.6	56.3	55.3	52.5	53.3	53.2	51.5	51.3	50.4	—
Means	41.32	41.20	41.26	41.86	41.30	41.46	41.44	41.16	40.51	40.15	41.47	43.39	45.43	47.33	48.07	47.95	46.79	45.19	43.53	42.54	41.95	41.44	44.53	40.83
Normals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAGNETIC DECLINATION DURING THE MONTH OF JUNE 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10	11
1st	50.1	50.2	49.7	49.5	49.2	49.3	49.2	49.3	48.9	47.9	47.8	49.2	52.2	53.4	54.3	53.9	52.3	50.3	50.1	51.0	50.6	49.5	49.2	49.0
2d	49.0	49.0	49.6	48.6	49.3	48.5	48.2	48.0	47.4	46.0	45.8	46.4	49.4	52.4	53.1	53.4	52.5	51.0	50.8	50.3	49.4	48.7	48.3	47.4
3d	46.4	46.5	46.5	48.2	49.5	48.9	49.4	48.6	47.6	46.5	45.1	45.3	47.3	49.6	53.0	53.7	51.6	49.5	49.7	49.3	48.5	47.8	47.2	47.3
4th	47.0	46.6	46.5	46.2	46.2	46.2	45.6	45.4	44.4	42.9	43.5	45.9	49.6	52.3	54.5	54.2	(51.3)	48.4	49.6	49.0	48.9	46.5	45.6	42.6
5th	45.3	44.8	46.3	45.3	45.3	44.3	44.5	45.0	44.0	43.5	44.5	46.7	51.2	53.3	54.8	52.4	51.3	48.3	48.3	47.3	46.4	45.4	45.0	44.6
6th	44.4	44.4	44.7	44.4	45.1	44.3	44.4	44.5	43.2	42.3	43.1	45.2	48.1	53.3	54.7	53.3	52.0	49.3	48.3	47.5	47.3	46.3	46.5	44.5
7th	43.9	43.7	43.8	44.9	45.2	44.7	44.6	44.3	43.0	44.7	45.1	46.3	50.3	50.5	51.5	52.3	51.3	50.0	48.3	46.6	45.9	46.0	43.7	46.3
8th	46.2	46.1	46.2	46.0	46.0	46.4	46.8	47.1	45.6	44.3	43.7	44.0	46.4	50.3	51.6	52.4	51.8	45.8	51.8	51.3	46.1	44.6	40.3	41.3
9th	46.3	45.3	47.3	42.8	52.9	40.1	45.8	45.8	44.3	43.3	42.3	43.6	45.8	47.2	48.3	50.2	50.3	49.5	44.4	44.2	45.5	43.3	42.0	42.2
10th	41.8	44.5	42.3	42.1	43.3	42.3	42.3	42.0	41.8	41.0	41.4	41.6	44.4	46.3	47.4	48.5	48.1	46.3	45.3	44.2	43.2	42.5	42.3	41.3
11th	42.0	42.3	42.4	42.3	42.5	42.5	42.8	43.0	40.6	41.7	42.1	43.1	44.2	47.6	49.4	49.0	49.5	46.4	45.3	44.4	44.4	44.4	42.6	42.3
12th	41.3	41.1	41.5	42.1	42.3	42.3	42.3	42.6	42.4	41.1	40.9	41.7	33.4	46.7	47.5	48.4	48.3	47.2	46.2	44.8	43.6	42.7	42.3	42.3
13th	42.6	43.3	43.1	44.4	42.6	41.8	41.4	41.4	(41.3)	41.3	41.1	41.4	42.3	46.4	50.3	49.0	46.9	44.7	43.1	41.7	41.0	40.5	40.1	41.4
14th	39.9	40.3	40.6	41.1	40.8	41.3	41.3	41.2	41.0	39.8	39.2	40.2	42.9	44.6	45.8	45.3	42.7	41.3	40.8	40.3	42.0	39.5	39.3	38.8
15th	38.8	38.7	38.4	37.3	38.5	38.3	38.3	38.4	37.1	35.6	35.3	36.4	38.3	40.1	43.2	42.8	41.9	41.9	40.1	40.2	39.2	38.8	38.3	38.2
16th	37.6	35.3	36.0	36.4	36.5	37.0	35.2	33.5	36.1	35.4	35.4	36.6	40.6	41.4	41.4	42.1	40.8	39.2	38.7	39.8	36.3	34.3	33.3	35.3
17th	32.6	32.6	37.3	36.2	36.5	36.3	36.3	36.4	36.2	41.0	38.4	37.3	40.3	43.2	45.2	45.6	44.0	41.4	42.1	41.4	40.4	39.7	38.7	38.2
18th	38.0	37.7	37.5	38.2	36.3	37.6	37.2	37.4	38.6	35.9	36.2	38.4	40.2	43.4	43.4	44.9	44.4	43.3	41.3	41.3	42.3	42.5	39.9	38.1
19th	38.8	38.8	39.1	38.8	38.8	(38.3)	(37.9)	37.4	37.1	36.0	35.4	36.8	38.4	40.3	41.7	42.3	41.3	39.4	39.4	39.0	38.6	38.0	37.5	37.3
20th	37.4	37.2	38.0	38.2	38.2	37.3	37.3	37.1	36.0	34.4	35.1	36.1	38.4	41.4	41.6	40.3	40.6	39.2	38.5	37.6	38.1	37.3	36.9	36.3
21st	35.6	35.6	36.4	36.2	36.5	36.6	35.6	35.2	34.4	33.6	33.7	34.9	37.2	40.4	42.7	44.0	44.1	41.4	41.3	39.3	38.3	38.2	37.3	37.2
22d	36.6	36.2	36.9	36.8	37.1	36.7	36.7	36.0	35.6	33.7	33.3	36.4	38.1	39.5	41.1	43.0	40.2	38.4	37.4	36.4	35.3	34.8	34.3	34.3
23d	34.1	33.8	34.3	34.8	35.3	39.2	34.3	33.6	33.1	32.4	32.3	34.1	36.7	39.8	40.5	40.9	40.2	36.8	36.3	35.3	34.7	33.0	32.3	32.1
24th	33.3	32.5	32.4	32.3	33.2	33.2	32.9	32.8	31.6	30.9	31.5	32.9	35.4	39.3	42.1	42.5	41.0	38.2	38.2	37.3	36.8	36.3	35.3	33.9
25th	34.8	34.4	34.3	33.6	33.8	34.3	34.3	34.1	33.1	22.1	31.3	32.4	36.6	38.4	41.0	43.3	42.7	41.5	41.3	39.3	36.2	34.2	34.0	30.5
26th	31.6	31.3	29.3	31.3	31.2	30.6	31.8	31.3	30.4	29.4	29.4	30.9	33.9	37.3	38.5	39.8	36.4	38.4	37.3	34.3	35.3	33.4	36.2	35.4
27th	33.6	32.9	31.7	33.3	32.4	32.8	33.1	—	33.8	33.5	31.6	31.0	33.3	34.7	35.8	34.9	35.3	35.3	34.3	33.9	33.3	26.9	31.4	32.1
28th	32.2	32.3	32.3	32.3	31.6	31.3	32.3	—	32.3	32.0	31.4	31.5	32.2	33.1	34.3	34.3	33.4	33.0	32.3	31.3	31.4	31.0	30.8	30.3
29th	30.3	30.4	30.4	30.3	30.6	30.5	30.8	31.0	30.8	29.4	28.5	29.2	30.3	32.5	34.4	34.9	34.4	33.0	32.3	31.7	30.8	30.3	28.5	29.2
30th	29.2	28.8	28.9	28.9	28.9	28.5	28.6	28.7	28.6	28.4	28.2	28.4	30.6	32.4	34.3	35.3	34.3	32.1	32.4	32.2	31.3	30.4	33.1	29.5
Means	39.36	39.22	39.46	39.43	39.85	39.38	39.37	39.23	38.68	38.00	37.75	33.80	40.93	43.70	45.25	45.56	44.50	42.68	42.17	41.41	40.70	39.53	39.07	38.64
Normals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF JULY 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	41.2	42.8	42.4	42.4	41.2	41.9	41.5	42.0	41.7	41.0	41.1	42.5	44.9	47.1	48.3	49.0	49.8	47.5	46.9	45.0	44.0	43.4	43.0	42.0
2d	41.5	41.3	41.6	42.0	42.0	42.0	43.5	43.0	42.5	41.0	40.2	41.2	43.9	45.6	47.5	48.2	47.9	46.1	45.7	44.9	43.5	42.5	41.6	41.1
3d	41.0	41.5	41.1	41.8	41.4	41.0	41.2	41.8	41.1	40.0	39.3	40.8	43.2	46.0	48.0	48.2	47.8	45.2	45.2	43.6	42.0	40.5	39.5	39.0
4th	38.6	39.5	39.3	39.9	40.1	40.6	40.9	41.0	40.0	39.6	39.4	41.0	44.5	48.2	50.6	50.1	48.1	46.1	46.0	44.0	42.2	42.0	41.8	42.3
5th	41.5	42.2	42.3	42.2	41.5	41.8	42.0	41.5	41.1	40.0	40.9	42.4	45.0	46.0	49.1	49.9	49.5	46.8	47.2	46.0	44.0	43.2	43.0	43.4
6th	43.5	43.5	42.9	42.1	41.0	40.1	39.7	40.0	40.0	40.3	40.0	41.9	45.8	48.7	49.9	50.1	49.5	49.4	47.0	45.0	44.3	43.1	44.5	45.1
7th	45.0	45.0	45.0	46.1	48.2	46.8	45.0	45.7	44.1	42.9	42.8	44.2	44.7	45.9	46.1	46.6	46.1	44.0	44.5	44.2	43.3	44.0	44.1	42.2
8th	42.8	44.0	45.8	48.0	50.5	51.0	52.0	(51.1)	50.3	49.8	51.3	58.0	58.0	59.6	60.1	58.9	55.1	54.0	53.5	51.2	46.5	46.0	45.0	44.0
9th	44.1	45.0	45.8	45.9	46.3	46.7	46.0	45.4	43.9	42.1	42.9	45.6	48.5	51.0	53.0	54.0	52.9	49.0	49.3	46.9	45.9	44.5	42.9	41.8
10th	(43.1)	44.5	44.0	44.0	44.4	45.0	45.1	46.1	46.7	44.8	46.1	47.2	49.0	51.0	51.9	52.1	50.8	47.9	48.3	46.8	45.0	43.9	42.1	41.5
11th	47.6	40.4	42.5	42.1	41.4	38.8	38.9	36.7	36.8	36.1	40.0	45.3	50.1	56.5	57.5	58.1	54.1	51.2	51.2	52.3	55.1	54.3	45.6	44.0
12th	45.0	36.2	42.6	51.2	50.1	48.0	58.0	57.2	49.3	50.3	47.1	46.6	49.5	50.1	52.5	54.3	54.4	51.0	52.8	50.6	48.4	53.8	45.3	45.0
13th	43.9	43.0	42.0	41.6	43.9	42.0	41.0	39.9	38.3	36.7	38.9	42.2	48.2	52.3	56.0	57.0	45.7	51.2	50.9	47.3	45.8	43.9	42.9	40.1
14th	41.0	39.3	41.1	40.3	40.0	40.5	42.5	42.8	42.9	40.2	(41.3)	42.4	47.2	48.0	49.8	50.2	48.2	44.1	42.2	40.0	38.4	37.6	36.2	36.0
15th	35.3	36.1	35.6	35.1	35.7	35.0	34.5	34.3	35.3	35.0	36.9	40.0	42.2	45.0	47.3	49.3	49.0	45.0	44.2	42.0	40.0	38.2	37.7	37.0
16th	36.8	36.8	37.0	37.0	36.8	37.0	38.0	39.7	39.7	37.6	38.6	39.0	40.6	42.0	42.4	42.0	41.2	40.1	40.1	39.4	38.1	36.7	36.3	36.2
17th	36.5	36.5	35.7	36.2	35.7	35.2	35.1	35.2	34.0	33.1	39.3	41.3	46.0	51.0	54.0	55.0	53.7	50.0	50.5	42.1	39.8	37.3	37.2	38.9
18th	41.0	41.8	42.0	41.8	41.8	41.1	38.4	36.8	34.0	30.8	33.2	41.6	56.4	45.8	45.2	(47.3)	49.5	48.0	44.0	40.1	36.0	41.3	32.8	31.2
19th	29.8	35.9	29.4	30.9	37.6	43.2	36.9	33.0	29.8	30.2	33.5	41.3	46.5	49.8	52.9	55.4	51.2	46.7	45.5	38.8	46.9	42.0	41.0	42.0
20th	34.7	29.5	31.0	30.2	28.5	33.2	31.9	30.9	29.4	29.1	30.8	34.0	40.8	45.0	47.3	48.0	(47.3)	46.6	43.7	43.1	42.1	41.9	41.5	41.2
21st	44.4	45.4	44.9	44.6	45.0	44.9	45.1	45.3	44.5	44.6	44.1	45.5	48.6	50.7	52.5	53.0	50.6	48.6	48.6	47.3	47.2	46.2	44.6	44.2
22d	44.1	44.7	44.6	44.6	44.3	44.3	45.1	45.4	44.4	43.3	43.1	44.3	47.9	50.2	51.0	50.3	49.5	47.0	45.3	45.6	44.4	43.4	43.3	43.0
23d	42.0	42.2	43.1	43.1	43.2	42.1	41.8	41.2	40.8	40.1	40.6	44.8	47.2	49.1	49.1	47.8	47.1	47.4	48.9	44.8	44.0	38.7	37.8	
24th	39.9	36.8	43.6	42.0	42.5	41.8	40.7	42.0	41.9	39.1	39.0	39.8	43.2	47.0	48.6	48.0	46.9	45.0	45.5	43.3	42.6	41.9	41.5	41.0
25th	40.1	41.0	41.4	41.3	41.3	41.3	40.9	41.0	41.2	40.1	39.1	40.1	42.1	45.0	46.5	47.3	46.7	44.8	42.0	42.4	41.2	41.6	40.2	40.2
26th	40.4	40.4	39.8	39.9	39.8	40.0	39.1	38.7	37.9	36.3	36.2	38.2	40.9	45.0	47.9	48.4	47.2	43.7	41.2	41.2	41.0	38.1	37.2	36.9
27th	37.1	37.2	37.3	38.1	38.1	38.3	38.3	38.7	38.0	37.2	37.2	39.1	42.3	44.6	46.0	46.0	44.6	43.2	43.9	42.1	41.6	39.6	40.7	40.0
28th	39.4	40.1	40.2	40.2	40.1	40.1	40.1	39.3	37.8	36.9	36.8	38.1	43.0	48.2	51.1	52.0	49.1	46.1	44.1	43.1	41.4	40.4	40.3	40.4
29th	40.5	41.0	41.1	41.1	41.0	40.9	40.8	40.8	40.2	38.1	37.1	38.9	41.6	46.8	49.0	49.1	45.6	43.2	41.7	39.8	38.9	38.7	38.2	37.0
30th	38.1	38.2	38.4	38.4	38.4	38.9	39.0	39.1	37.8	36.4	37.1	39.6	43.3	48.1	51.1	50.9	48.8	44.3	43.5	43.1	41.4	40.1	39.3	39.1
31st	37.5	36.2	42.1	37.3	36.4	36.1	35.4	33.1	33.1	35.9	38.6	42.4	46.0	48.4	48.7	47.2	44.3	41.1	40.9	39.8	38.8	38.1	37.9	
Means	40.56	40.26	40.83	41.01	41.23	41.28	41.27	41.02	39.96	38.92	39.65	41.98	45.65	48.19	50.02	50.21	48.90	46.68	45.90	44.23	43.08	42.35	40.84	40.37
Normals	41.47	39.76	42.09	41.21	41.17	41.20	41.07	41.03	40.60	39.17	39.30	41.31	45.13	47.52	49.60	48.77	48.18	46.32	45.29	43.60	43.06	42.05	41.15	40.36

MAGNETIC DECLINATION DURING THE MONTH OF AUGUST 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	37.5	34.1	35.9	37.3	37.9	37.1	36.9	39.5	36.4	35.9	36.9	40.3	33.2	47.6	50.7	51.9	51.0	47.5	46.0	43.3	41.0	39.4	38.2	37.6
2d	37.2	37.1	36.9	36.8	37.3	37.1	(35.6)	34.1	33.3	34.0	35.9	38.8	43.5	47.8	51.1	51.9	50.1	48.3	45.7	45.1	42.3	40.0	38.5	37.4
3d	37.0	36.6	36.2	37.0	37.3	36.3	36.6	37.6	36.7	36.1	38.2	41.6	44.6	47.7	50.0	50.8	49.2	47.0	44.6	43.2	42.1	41.1	40.6	40.5
4th	40.8	41.2	41.8	41.5	42.2	41.4	41.0	40.4	38.4	37.2	36.1	36.6	39.0	41.4	43.7	45.1	45.1	43.4	43.3	43.1	42.8	42.3	42.1	41.8
5th	40.5	40.1	38.8	38.2	39.1	40.2	40.3	40.2	39.3	37.8	37.8	39.7	44.8	47.0	48.9	50.3	52.1	47.7	45.5	43.8	42.4	42.1	40.6	41.0
6th	41.1	41.8	42.0	42.0	41.1	41.0	40.9	40.7	38.7	37.2	37.2	34.7	42.2	44.6	46.7	47.2	46.1	43.4	42.2	41.3	40.5	39.6	39.0	38.7
7th	38.1	37.9	38.3	38.3	39.0	38.4	37.9	37.8	36.0	34.2	34.3	35.9	39.8	44.5	48.1	49.4	48.2	45.1	42.1	40.9	39.1	37.9	36.9	36.1
8th	35.6	35.4	35.5	35.9	35.1	35.1	36.3	36.8	36.8	35.9	35.3	37.0	39.6	42.1	44.3	44.9	46.6	43.0	41.1	40.0	39.6	37.9	37.0	36.2
9th	36.7	36.2	36.1	36.1	35.9	35.6	35.3	33.9	32.9	32.9	34.1	38.1	40.1	44.1	46.3	47.2	47.5	44.1	40.8	39.8	39.8	38.1	38.1	37.1
10th	37.2	37.5	36.4	37.1	36.5	36.8	37.2	36.9	35.9	34.3	33.2	35.6	38.2	42.6	45.1	45.9	43.9	41.4	39.1	37.6	37.1	34.6	34.0	33.1
11th	35.4	33.2	32.1	31.5	34.1	33.4	34.7	35.4	35.1	35.9	37.5	41.6	45.4	48.2	44.3	49.2	47.6	45.1	43.0	41.6	40.2	38.8	37.3	36.2
12th	36.0	35.5	35.4	35.5	35.9	36.2	36.7	35.0	36.1	36.2	39.9	42.6	45.9	48.4	51.1	51.2	51.1	47.9	43.1	44.5	41.4	40.6	40.7	40.1
13th	37.5	39.4	40.5	41.0	42.1	42.4	42.0	41.2	38.9	38.1	39.5	40.5	42.0	43.6	44.6	44.2	44.2	42.0	39.4	38.1	38.1	37.8	37.2	37.1
14th	36.4	36.1	35.7	35.1	35.3	34.9	34.6	34.8	32.7	33.1	35.3	38.2	45.1	48.5	49.1	47.1	45.1	42.3	39.7	40.1	38.7	38.1	38.1	38.1
15th	38.1	37.8	37.4	37.2	37.6	38.0	37.8	37.8	37.4	37.2	38.8	41.3	44.1	46.6	47.2	49.0	50.0	46.1	43.1	43.2	42.5	41.9	41.2	40.7
16th	40.4	41.5	42.5	43.1	42.3	42.0	41.1	40.2	38.9	37.0	37.1	39.2	42.3	45.9	48.8	51.7	49.0	48.6	46.1	47.8	39.8	45.1	39.4	37.1
17th	35.7	35.6	36.3	37.1	38.2	39.7	40.0	40.2	38.3	36.9	37.9	41.6	45.9	49.0	42.5	53.0	50.1	44.2	41.9	41.4	37.7	34.9	36.0	34.2
18th	34.0	35.0	36.9	37.0	37.1	37.6	38.0	38.2	37.6	36.9	37.9	39.6	44.2	48.9	50.9	51.1	48.4	46.7	50.1	49.6	47.1	46.1	41.1	3

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF SEPTEMBER 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	46.0	46.1	46.3	46.3	46.1	46.1	48.0	47.4	42.3	40.6	40.9	42.3	45.7	50.1	55.0	55.1	54.1	50.8	47.0	45.2	43.4	41.6	38.5	39.6
2d	40.5	40.0	39.6	40.0	40.1	41.1	40.9	42.4	39.9	39.1	38.0	39.1	40.6	47.8	52.9	62.6	72.4	82.1	63.1	70.1	57.4	45.1	57.1	41.1
3d	49.6	24.1	40.1	42.0	57.6	49.4	50.0	51.9	46.0	45.1	35.9	40.1	39.3	41.1	43.6	44.8	50.3	50.0	42.6	42.2	41.1	34.1	36.2	41.2
4th	38.8	46.2	46.1	39.1	44.1	44.5	44.1	43.2	37.9	38.2	39.7	40.7	46.6	53.6	56.1	51.1	51.0	54.1	43.2	46.3	46.3	28.8	42.1	35.0
5th	40.4	40.6	43.2	48.1	46.3	46.0	46.1	46.4	52.3	41.8	36.4	40.2	55.2	50.1	54.0	54.5	54.1	54.9	54.6	52.6	52.1	18.2	42.4	46.0
6th	40.9	39.1	39.1	47.4	47.1	45.1	44.9	43.8	38.4	38.1	37.1	39.2	44.1	47.6	56.1	57.9	59.1	53.1	51.7	44.1	44.5	41.1	40.6	41.1
7th	39.6	38.1	36.9	35.9	45.1	41.1	43.7	42.4	39.5	43.0	41.1	42.6	45.3	49.4	52.6	53.0	50.7	45.6	42.1	42.1	41.2	41.9	42.6	43.0
8th	42.1	41.1	41.5	41.3	40.8	39.9	39.9	38.1	37.4	37.9	42.0	46.1	48.1	51.4	53.4	53.0	50.1	45.8	42.5	43.2	42.6	41.3	41.1	40.0
9th	36.6	38.8	37.7	39.9	38.3	38.2	37.8	37.8	37.4	40.7	36.1	38.9	45.2	49.5	50.9	51.1	50.1	48.8	48.1	48.0	48.1	47.9	48.0	48.0
10th	48.0	48.1	48.2	47.3	47.1	46.6	46.3	43.1	41.4	40.2	39.8	42.1	47.2	52.2	55.7	56.0	54.1	52.0	51.0	48.5	47.4	46.8	45.4	45.6
11th	45.3	45.4	45.1	44.3	44.8	44.1	45.1	41.4	37.5	38.1	40.6	43.8	50.0	55.1	57.1	57.1	54.3	50.2	46.9	46.5	45.1	43.8	43.1	43.2
12th	43.3	43.2	43.4	43.2	44.8	43.8	45.3	41.4	37.4	37.2	43.6	49.1	51.0	53.5	51.5	49.8	47.9	44.8	41.1	41.4	40.0	38.1	38.3	38.7
13th	39.1	39.2	39.1	38.6	38.5	39.5	38.5	37.1	36.7	34.9	38.1	41.2	46.2	50.2	51.8	53.8	56.1	53.9	44.0	42.4	40.1	38.1	35.6	36.1
14th	35.2	32.7	35.0	38.5	35.7	38.0	39.9	36.9	34.4	34.5	34.3	36.0	38.1	39.6	39.1	38.5	34.2	32.4	33.8	34.1	32.9	33.1	32.2	32.1
15th	31.0	32.0	32.3	31.1	32.8	32.2	32.5	30.3	28.1	30.2	30.5	33.3	36.8	39.5	40.8	41.4	40.8	38.0	34.3	30.8	29.6	30.4	26.2	28.8
16th	29.1	30.1	30.2	31.3	32.9	33.0	32.1	29.9	26.5	26.1	29.1	35.5	40.1	40.9	40.1	38.1	35.3	32.1	29.2	30.2	31.0	29.1	27.6	27.5
17th	26.1	23.0	26.4	26.0	28.2	28.4	28.0	25.3	27.4	30.5	32.4	35.7	38.9	41.1	43.5	45.0	43.3	41.0	36.5	35.1	33.1	32.1	33.0	31.9
18th	31.1	32.1	32.4	31.2	30.8	34.8	32.1	31.1	30.4	34.4	38.4	43.2	46.5	48.1	48.2	46.1	43.1	40.3	37.1	36.4	35.1	33.1	32.1	31.1
19th	32.3	30.8	31.9	32.1	33.4	32.2	31.1	29.8	28.7	30.9	35.1	40.7	45.3	47.3	48.4	52.1	49.5	41.4	35.3	34.8	33.4	31.1	30.9	30.7
20th	30.6	29.9	28.8	28.6	29.1	29.5	29.5	28.1	30.2	34.8	43.1	47.1	49.8	53.7	54.5	50.9	48.8	46.8	45.6	41.9	47.1	47.2	47.1	47.2
21st	47.1	47.1	47.1	47.2	46.9	46.1	46.1	41.3	41.7	40.5	43.2	44.1	48.0	51.2	54.0	54.2	52.3	48.9	49.3	48.5	48.1	48.2	47.8	47.8
22d	47.2	46.3	47.3	48.1	48.0	46.4	46.1	42.2	39.6	39.8	41.8	45.1	51.9	55.1	56.1	55.1	53.1	50.1	47.1	43.9	44.1	43.8	43.3	43.2
23d	41.2	43.4	43.0	41.2	40.1	39.2	37.8	35.4	36.0	39.6	41.1	45.2	50.1	53.1	55.1	53.8	49.3	45.2	43.6	43.9	43.6	43.1	42.1	41.2
24th	41.3	40.9	40.2	40.2	40.1	38.5	38.0	34.8	34.0	36.1	40.8	46.1	51.3	55.3	56.2	56.1	54.2	49.4	47.1	47.0	44.8	43.0	41.8	39.6
25th	37.6	38.1	35.7	33.1	33.1	37.9	38.6	40.2	46.6	46.9	48.7	57.6	53.6	55.5	56.2	53.5	51.1	47.6	46.6	46.0	47.3	47.5	47.3	43.6
26th	44.1	45.4	46.0	44.1	43.7	45.1	44.9	39.3	39.4	40.3	41.2	45.8	50.3	53.5	54.1	53.0	44.3	44.9	43.1	40.3	41.1	41.0	40.1	39.0
27th	39.0	39.0	38.8	38.0	38.0	38.9	41.0	38.9	36.0	37.9	44.9	44.8	49.4	54.1	55.2	55.0	53.2	48.3	43.0	38.6	37.2	38.3	38.1	37.6
28th	38.2	38.2	39.1	39.7	39.9	42.1	43.5	44.9	48.7	44.9	41.2	46.4	52.1	55.7	56.9	56.6	53.0	49.9	49.1	41.4	43.7	46.0	39.1	39.1
29th	40.7	39.5	41.1	39.1	37.4	38.6	40.7	(42.2)	43.8	45.3	46.9	48.6	50.2	51.8	53.3	53.9	51.6	48.6	46.6	45.2	44.9	45.2	45.3	45.3
30th	45.3	45.4	45.9	45.8	45.7	47.2	47.2	41.3	37.6	36.2	38.2	41.4	46.3	51.8	54.4	54.5	51.5	49.0	47.2	45.2	46.2	45.9	45.2	45.3
Means	39.58	38.80	39.58	39.62	40.55	40.45	40.66	38.94	37.77	38.13	39.34	42.73	46.77	49.96	51.89	51.92	50.43	48.00	44.41	43.20	42.42	39.60	40.34	39.65
Normals	39.66	39.68	39.90	39.76	40.82	40.36	41.21	40.54	37.90	38.14	39.92	42.88	47.65	51.00	54.24	53.65	51.63	48.25	44.86	43.79	43.29	41.25	41.92	40.46

MAGNETIC DECLINATION DURING THE MONTH OF OCTOBER 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	45.0	47.2	47.6	47.7	46.3	45.2	43.2	40.9	37.6	36.2	36.2	39.5	46.3	51.5	55.2	55.2	54.2	51.4	47.2	47.0	45.2	45.3	44.9	45.0
2d	45.2	46.0	45.2	45.3	47.0	50.2	48.4	47.5	44.4	43.1	46.7	41.1	45.8	50.3	52.7	52.8	50.5	47.6	45.2	45.0	45.0	45.2	44.5	44.2
3d	43.2	40.5	37.9	37.7	41.8	35.2	39.0	37.2	41.1	34.7	38.5	44.2	52.5	54.1	54.4	52.7	51.1	48.1	47.2	46.1	45.2	46.1	41.3	44.0
4th	42.3	44.2	44.1	45.2	45.5	46.6	47.0	41.1	36.9	36.1	36.9	40.6	47.8	52.1	55.0	55.7	52.7	50.3	48.1	40.2	43.2	42.9	40.0	42.2
5th	43.1	39.6	49.8	41.2	47.2	46.2	44.2	39.8	36.5	33.3	34.8	40.8	49.5	53.7	56.0	55.2	52.2	49.2	47.7	45.2	46.2	44.2	38.7	42.2
6th	38.0	44.2	44.2	45.2	45.2	46.1	45.1	41.0	36.2	36.7	35.8	41.4	48.7	53.7	53.3	52.6	50.2	47.4	47.0	47.4	46.1	45.5	46.0	45.2
7th	45.2	46.0	44.4	47.2	45.7	45.2	43.3	39.9	36.4	37.3	40.2	44.2	49.9	53.2	54.2	51.3	48.4	46.0	44.2	46.2	45.5	45.4	45.7	45.1
8th	39.2	48.7	42.7	44.8	45.2	45.4	43.6	39.8	36.3	34.2	36.1	43.1	50.2	54.1	54.1	53.4	51.2	47.6	46.3	45.3	45.3	46.0	45.9	45.3
9th	45.3	45.4	45.2	45.3	45.9	45.8	45.5	41.0	37.2	35.3	36.2	39.4	45.8	51.0	53.2	53.5	51.5	48.7	47.2	46.7	46.4	46.2	46.2	46.1
10th	45.5	45.4	45.3	45.2	45.2	44.7	44.2	40.9	37.8	37.5	40.1	44.9	51.2	56.2	57.2	56.2	52.7	48.8	46.9	47.2	46.7	46.5	46.3	46.2
11th	45.7	45.3	45.2	45.1	44.6	44.2	43.0	39.0	36.2	34.2	35.4	41.4	50.3	56.2	59.1	57.2	53.3	49.2	47.3	47.4	47.3	44.3	45.3	45.3
12th	44.3	44.9	44.7	45.2	43.6	45.2	43.3	40.0	36.1	34.1	37.7	44.2	54.2	59.5	63.1	60.1	56.6	50.2	47.9	45.7	41.5	43.6	34.7	45.0
13th	31.0	20.0	7.1	11.2	26.7	36.9	38.6	42.8	41.4	40.5	42.3	45.2	49.7	53.1	54.5	54.0	48.3	45.3	43.5	40.3	44.2	45.1	45.2	47.3
14th	46.7	46.7	46.2	46.6	48.1	45.4	44.2	39.5	37.8	37.9	37.4	41.2	46.2	52.2	56.2	55.1	52.3	49.1	47.1	46.4	47.0	44.5	45.3	45.8
15th	44.6	45.7	46.2	45.2	45.3	45.2	44.2	39.3	35.2	34.0	35.8	41.2	49.2	55.7	58.0	58.2	54.2	50.5	43.2	46.6	46.4	46.2	42.4	43.2
16th	42.0	43.2	43.2	41.1	43.7	45.1	44.2	41.4	40.3	36.3	37.7	42.0	48.2	53.6	56.0	54.9	51.9	48.5	47.2	47.0	47.0	46.3	46.1	44.7
17th	43.8	43.2	42.5	42.8	43.2	43.9	44.3	41.2	36.4	35.8	33.8	41.4	47.2	54.7	58.7	58.2	54.2	51.4	47.6	44.2	41.7	43.6	45.1	45.2
18th	45.2	46.6	46.2	46.2	44.7	41.2	44.3	46.5	39.9	28.2	34.5	41.2	48.2	55.7	60.3	64.2	61.4	62.1	49.5	44.4	39.2	29.2	47.4	37.8
19th	34.1	37.2	32.9	38.3	39.1	43.3	53.5	48.9	48.2	46.2	39.1	44.2	46.1	47.5	46.2	49.4	46.3	48.2	39.5	43.5	43.3	45.5	43.2	42.2
20th	42.4	36.4	42.7	42.5	43.2	41.7	45.7	42.4	39.9	39.1	40.2	41.3	44.2	48.6	51.2	52.2	49.4	48.8	48.2	47.5	46.2	46.2	43.3	40.9
21st	37.5	39.4	41.2	42.3	45.2	43.3	42.0	40.6	43.5	42.3	39.4	45.0	47.3	49.3	50.2	51.8	52.2	48.3	47.8	46.3	45.7	39.8	35.7	44.2
22d	41.2	44.7	36.5	45.2	44.7	40.3	41.2	41.3	36.9	40.6	43.7	44.5	48.2	52.7	53.2	51.2	49.1	47.2	44.2	46.1	43.2	45.2	45.7	45.3
23d	42.7	45.7	47.1	46.2	45.2	45.0	42.3	40.3	41.1	40.2	42.3	45.6	48.4	52.4	52.2	51.1	49.1	47.2	46.7	46.2	45.4	45.8	46.4	46.4
24th	46.9	45.5	45.2	45.5	42.7	42.3	41.1	38.9	36.9	37.2	39.9	46.2	50.9	53.4	53.8	52.2	49.3	47.8	47.8	46.9	46.4	46.3	46.2	46.2
25th	45.8	45.7	45.4	45.2	45.2	44.6	44.2	42.1	37.9	36.3	38.5	44.8	50.8	53.6	54.2	53.2	51.2	49.2	47.7	47.2	47.2	46.8	46.3	46.2
26th	47.6	45.2	45.1	44.3	44.2	42.7	40.3	39.7	37.2	36.4	39.4	45.9	53.2	57.6	59.4	56.2	52.4	49.1	46.9	46.2	46.3	46.2	43.3	43.2
27th	45.2	45.1	44.3	44.2	44.0	43.3	41.5	37.9	35.6	34.2	37.2	44.2	51.2	55.9	57.2	55.2	52.4	50.2	48.3	47.4	47.2	46.3	46.2	46.2
28th	45.8	45.6	45.9	45.9	48.2	45.1	43.8	40.2	36.3	37.3	39.0	43.3	48.2	52.2	55.3	54.4	53.1	49.6	48.2	46.4	47.7	47.0	46.4	46.2
29th	46.2	45.7	45.6	45.0	41.3	43.6	41.2	38.8	37.4	37.7	39.7	44.1	49.8	54.1	55.4	55.3	53.4	51.2	48.7	48.2	44.4	39.6	43.3	43.8
30th	39.2	42.0	44.2	44.0	46.2	43.2	40.9	39.9	38.6	36.1	39.9	46.9	47.2	51.2	53.9	53.6	51.2	49.2	47.4	46.2	42.7	43.2	45.8	45.9
31st	45.1	45.3	45.2	44.7	43.4	42.2	42.0	39.2	37.5	35.1	40.0	45.3	52.4	57.6	58.2	55.1	51.8	49.2	46.2	46.2	46.5	45.2	44.7	45.1
Means	43.06	43.43	42.87	43.27	44.21	43.88	43.53	40.94	38.41	36.91	38.53	43.17	48.99	53.44	55.21	54.56	51.86	49.25	46.71	45.89	45.20	44.49	44.11	44.57
Normals	44.52	45.19	44.69	44.80	44.99	44.10	43.33	40.22	37.66	36.46	38.22	43.17	48.98	53.61	55.25	54.20	51.55	48.82	46.95	46.28	45.40	45.38	45.13	44.79

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF NOVEMBER 1859.

Value of a part of division = 0.802 min

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	45.4	44.2	45.0	44.2	43.2	43.2	38.5	38.4	38.3	37.3	39.2	45.3	52.3	53.4	54.5	52.1	49.0	46.2	44.4	45.2	46.2	46.5	46.6	46.7
2d	46.7	46.7	47.2	47.0	46.4	45.5	42.2	38.2	36.1	36.2	40.1	46.2	51.5	57.1	58.4	54.1	51.2	47.2	45.1	46.2	47.0	46.4	46.3	47.2
3d	47.2	46.2	47.3	47.4	47.3	45.9	46.2	41.0	37.2	35.8	37.6	42.6	47.2	53.1	53.7	51.5	54.8	48.4	46.5	46.0	47.1	45.3	45.1	44.3
4th	43.2	45.3	45.1	45.7	49.2	42.0	43.0	38.1	36.2	36.8	41.0	46.1	51.9	55.2	55.4	53.2	51.7	48.2	47.2	45.8	46.6	46.2	46.0	45.4
5th	45.2	45.2	45.3	45.4	45.2	44.0	41.2	38.3	36.1	34.7	36.1	40.0	46.2	52.0	54.9	54.8	51.7	49.2	47.3	46.2	47.8	47.0	46.1	44.5
6th	44.5	44.4	45.1	45.2	44.3	44.2	41.7	39.2	36.9	36.4	39.0	42.8	46.8	51.3	54.0	52.9	51.1	49.0	45.9	47.1	46.7	46.4	46.1	43.2
7th	41.9	44.4	44.3	43.7	44.3	41.9	39.5	39.7	36.5	37.4	41.1	47.2	51.8	55.2	56.5	55.2	52.2	50.2	46.7	40.8	45.3	44.7	38.1	39.1
8th	39.0	43.2	45.7	45.9	45.4	44.2	41.0	37.2	35.0	34.3	38.3	44.9	51.2	54.7	56.4	54.0	50.7	49.2	44.7	44.7	45.5	45.3	49.1	44.9
9th	41.0	42.1	44.5	42.2	45.0	44.1	39.4	38.1	36.4	34.7	39.3	45.7	50.2	55.0	55.2	51.3	47.7	45.2	46.0	46.7	46.2	46.2	46.0	45.2
10th	42.9	44.7	44.8	44.1	44.2	41.5	37.4	37.2	35.6	36.4	41.1	45.2	50.4	53.5	54.3	51.3	49.2	46.3	45.0	44.2	45.0	43.2	44.2	41.4
11th	34.5	45.2	35.2	39.4	46.0	38.5	35.1	28.2	31.2	36.7	44.7	49.0	52.7	55.3	57.5	53.3	50.5	45.2	45.3	43.1	41.5	44.4	45.4	45.6
12th	45.7	45.4	45.4	46.4	46.0	44.2	42.3	41.1	40.3	39.0	41.3	45.6	50.8	54.4	59.2	57.7	49.9	46.8	50.7	50.6	47.8	45.2	42.5	45.2
13th	43.2	38.5	43.3	51.1	46.0	43.0	40.2	40.2	39.2	39.2	42.2	48.0	54.1	58.0	59.2	57.4	55.2	49.7	46.2	42.7	41.2	41.5	47.2	34.2
14th	35.7	37.5	39.2	42.7	45.2	43.2	42.1	40.3	38.9	38.0	42.1	45.2	48.4	52.8	55.2	54.3	53.4	48.9	47.0	46.2	46.0	46.2	44.8	43.2
15th	44.5	45.3	44.7	45.0	47.6	44.1	41.1	38.2	34.7	35.2	38.4	42.2	47.4	51.6	52.2	51.8	50.5	50.0	48.9	47.2	47.0	44.2	38.2	42.2
16th	43.0	44.0	44.2	44.4	44.4	43.2	41.0	37.2	35.2	35.1	36.9	39.5	44.3	51.3	54.6	54.2	53.2	52.7	49.4	48.3	48.3	46.0	40.7	38.2
17th	40.4	44.1	45.2	46.2	46.0	44.8	42.2	37.9	34.3	32.7	36.7	41.7	47.5	52.2	54.3	54.2	52.3	49.3	46.2	46.2	46.1	46.2	46.2	46.1
18th	45.4	46.1	44.9	46.7	47.1	43.7	41.5	36.8	37.1	35.4	39.0	42.2	46.3	50.4	53.3	53.4	51.7	48.6	46.3	45.2	44.2	46.2	46.2	45.2
19th	44.9	45.7	46.1	46.1	46.4	50.0	43.2	36.5	34.4	33.7	35.9	41.4	46.4	52.2	54.3	53.2	50.8	48.0	46.2	46.4	45.2	44.9	44.7	44.2
20th	41.2	39.8	45.0	46.1	47.2	44.4	43.0	37.9	34.2	37.3	37.1	41.1	48.2	52.3	53.7	51.7	51.1	48.2	46.2	46.2	46.3	46.0	46.2	46.2
21st	45.5	45.2	45.2	45.2	45.3	44.7	43.6	38.1	36.5	35.4	36.5	39.3	45.2	50.2	52.2	51.4	50.2	48.2	47.1	46.4	47.1	47.1	46.2	46.2
22d	46.3	46.2	45.4	45.7	44.9	43.7	41.7	49.9	38.1	39.0	44.2	49.2	53.8	57.1	56.7	53.7	50.2	47.2	46.2	46.7	46.9	46.3	45.7	45.2
23d	46.2	45.8	45.5	46.2	46.0	45.2	42.1	38.4	37.9	38.3	42.8	47.4	52.1	54.4	54.8	52.8	50.2	48.3	46.3	46.4	45.9	45.9	45.6	45.7
24th	47.6	44.2	45.0	43.7	42.9	41.2	38.7	35.6	33.1	36.3	40.5	44.7	48.2	52.3	54.2	52.7	51.7	47.6	45.8	46.2	46.2	46.2	46.2	46.1
25th	45.3	45.0	44.2	43.9	43.1	41.7	38.4	35.9	34.2	34.1	38.5	44.3	49.5	54.3	56.2	55.8	53.0	50.1	47.2	47.1	46.4	45.4	38.9	43.0
26th	45.1	45.9	45.2	44.7	45.2	43.1	39.2	35.4	33.9	35.2	40.0	45.3	52.2	56.5	57.4	55.1	52.1	49.1	46.3	45.8	47.2	46.5	46.5	46.2
27th	45.5	46.2	46.3	46.2	45.9	44.2	41.8	37.7	35.4	34.7	37.6	43.9	49.9	54.6	57.2	55.9	52.1	49.1	46.3	46.2	46.6	46.2	45.2	45.7
28th	46.2	46.2	44.5	44.0	45.2	42.6	39.6	36.2	35.4	36.3	38.7	42.7	46.8	52.2	55.5	55.4	52.7	49.5	46.2	46.2	46.2	46.2	45.2	46.3
29th	46.2	46.2	47.2	46.5	47.2	46.2	44.9	42.2	39.2	35.4	35.2	38.9	42.6	48.4	51.8	52.2	51.2	49.2	47.1	46.2	46.2	46.2	46.2	46.2
30th	45.7	46.2	46.5	46.4	46.4	45.6	43.3	40.0	35.8	34.3	34.0	38.1	44.3	50.2	54.2	55.3	52.9	51.1	47.2	45.9	45.8	46.1	45.4	47.1
Means	43.84	44.50	44.75	45.25	45.62	43.79	41.17	38.30	36.11	36.04	39.17	43.86	48.99	53.37	55.23	53.73	51.47	48.53	46.56	45.94	46.05	45.67	44.50	44.33
Normals	44.66	45.16	45.29	45.25	45.62	43.76	41.21	38.25	36.28	36.04	38.97	44.24	49.22	53.39	55.23	53.73	51.47	48.53	46.56	45.95	46.39	45.67	45.10	45.13

MAGNETIC DECLINATION DURING THE MONTH OF DECEMBER 1859.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	46.5	44.8	46.4	45.5	45.0	42.6	41.2	37.3	34.1	35.2	39.0	42.7	47.9	53.3	56.1	54.0	53.2	50.7	46.5	45.2	45.2	46.6	46.2	44.2
2d	44.2	46.2	44.4	44.2	44.2	41.3	41.0	37.2	34.3	34.7	32.4	45.2	50.3	54.2	53.7	53.6	50.9	49.2	46.2	45.7	46.2	45.8	46.3	46.3
3d	46.2	46.1	47.1	45.3	45.2	44.3	42.2	37.2	35.2	33.3	37.0	43.2	50.4	54.2	55.2	53.7	53.7	51.0	49.3	47.3	46.6	46.3	46.2	46.2
4th	45.7	45.7	46.1	46.1	45.3	43.4	40.2	38.0	36.0	36.1	38.2	44.9	51.3	55.5	55.3	55.1	52.8	49.9	47.4	46.2	47.2	44.7	45.4	45.3
5th	44.6	45.0	44.4	44.6	43.2	43.1	38.8	32.2	32.3	36.7	40.7	47.1	53.9	58.2	57.6	57.2	54.2	50.3	45.1	47.9	47.5	43.6	42.9	40.0
6th	42.8	44.2	45.2	43.1	44.7	42.1	37.4	35.7	33.6	37.5	43.1	49.2	53.3	56.3	56.4	54.2	50.4	47.2	46.3	47.2	43.3	46.3	45.3	45.8
7th	45.2	46.2	46.0	43.1	41.2	39.4	41.0	32.3	32.1	33.3	47.3	49.4	56.2	59.4	58.1	56.4	55.0	51.3	48.3	48.3	48.2	48.2	44.0	45.1
8th	45.5	45.0	45.3	41.2	46.1	42.2	38.6	35.2	42.1	37.3	41.4	48.2	55.3	60.4	61.2	60.3	56.2	48.2	47.2	46.2	38.2	39.4	43.3	45.2
9th	43.6	44.7	42.7	44.3	47.0	46.9	40.3	38.2	35.2	38.7	43.7	49.2	53.7	57.3	56.6	56.2	52.6	49.7	46.3	46.2	46.2	46.2	38.1	41.2
10th	40.7	38.2	43.4	45.2	45.0	44.2	39.2	36.1	35.3	36.2	40.5	47.8	53.3	57.2	58.2	57.2	54.2	51.2	48.2	47.2	47.2	46.2	44.3	45.6
11th	47.1	46.2	46.2	46.7	47.6	45.0	42.2	41.1	37.9	34.0	35.2	43.0	50.3	55.7	60.5	59.2	54.5	50.2	43.7	43.7	44.2	39.2	40.7	41.2
12th	38.2	41.2	44.2	47.2	45.2	46.0	43.2	39.3	35.8	31.3	36.0	43.9	51.2	54.3	55.2	54.2	52.0	48.0	46.2	46.2	46.4	47.0	47.0	47.0
13th	46.6	46.7	46.4	46.3	45.3	43.3	41.2	35.9	34.2	35.0	39.2	44.4	51.2	56.7	58.5	57.0	53.9	51.9	48.9	32.5	36.4	39.2	29.2	42.0
14th	36.4	44.8	42.2	39.3	25.0	36.7	30.2	28.2	31.2	33.9	37.4	42.3	46.9	52.1	55.9	53.2	52.7	50.2	49.2	47.5	47.3	47.4	46.4	45.6
15th	46.2	46.2	45.3	44.2	41.2	42.3	40.8	40.0	33.9	33.6	38.5	44.0	46.0	55.0	59.2	57.7	55.3	48.8	48.5	48.0	43.4	43.0	42.4	41.2
16th	41.4	42.2	45.2	47.5	47.7	44.4	40.6	38.2	35.2	36.7	37.1	40.4	45.9	51.2	54.7	56.2	56.2	52.2	50.1	46.6	49.2	39.2	40.3	41.2
17th	42.9	45.2	44.3	44.9	47.0	42.3	41.7	37.7	39.2	36.0	40.4	44.7	51.2	53.3	56.3	56.6	55.1	52.2	49.4	47.5	46.5	46.1	45.4	45.6
18th	45.5	47.2	48.2	48.0	47.2	45.2	43.2	40.3	38.1	36.9	41.2	46.7	51.2	55.6	58.8	58.2	54.9	51.2	48.2	47.8	47.2	45.2	44.6	45.7
19th	46.2	46.5	46.9	47.1	45.5	44.2	41.2	37.2	33.4	32.7	35.8	42.8	49.3	54.2	54.6	53.2	51.1	49.2	47.2	47.0	47.2	47.2	47.0	47.0
20th	46.3	46.2	47.2	46.3	46.7	44.2	41.1	36.3	35.3	39.3	43.9	49.2	54.0	56.2	56.2	53.8	51.8	48.1	46.0	46.7	46.2	45.3	44.9	44.2
21st	46.2	44.5	42.3	47.8	45.2	40.1	37.3	23.7	29.9	34.2	41.4	46.4	53.0	57.4	56.9	53.3	49.9	47.5	46.5	46.7	48.2	47.7	46.7	47.2
22d	46.3	46.2	45.1	46.2	44.0	40.3	37.2	35.0	34.2	37.9	43.3	50.0	55.7	59.2	60.5	57.4	53.5	49.4	46.7	48.1	47.6	47.3	47.3	47.7
23d	45.2	43.2	44.2	44.2	43.2	42.3	39.5	36.3	34.2	35.4	39.5	43.3	52.2	55.4	58.2	56.7	54.2	50.8	48.2	44.7	45.6	44.2	47.0	46.4
24th	42.1	41.9	45.2	44.4	47.5	39.2	41.1	34.6	34.2	34.2	40.2	50.2	53.1	56.4	57.7	56.2	52.5	49.1	47.3	47.2	46.9	47.1	47.2	47.2
25th	46.7	47.3	47.3	47.4	47.2	46.8	43.3	38.5	37.1	36.5	38.7	44.5	48.5	54.3	57.4	57.2	53.8	51.2	47.0	45.8	44.5	46.2	46.8	46.6
26th	46.2	46.4	46.2	46.3	46.2	45.2	42.2	38.7	37.1	41.3	43.2	44.4	50.3	53.9	58.2	58.5	55.2	50.7	48.4	46.4	47.4	47.3	45.3	43.3
27th	46.0	46.1	44.2	46.2	45.2	44.4	41.2	38.0	37.2	35.2	39.5	44.2	48.3	54.2	57.0	56.1	54.2	51.2	49.2	47.3	47.3	46.6	46.7	46.6
28th	45.9	46.1	46.4	46.3	46.3	46.2	44.7	40.4	36.8	36.3	41.0	45.8	49.2	55.1	57.4	57.3	55.2	51.3	47.8	46.2	45.9	45.1	45.2	46.1
29th	41.9	46.2	48.2	47.1	46.2	45.1	42.3	39.5	37.5	36.9	39.6	44.2	49.0	53.1	55.8	55.2	52.9	50.6	48.1	47.2	47.1	46.8	46.3	46.3
30th	45.2	46.1	46.2	46.2	46.2	45.4	43.2	39.4	39.9	40.5	43.0	47.0	50.3	55.2	54.2	52.1	50.5	49.2	48.5	47.4	47.3	46.3	44.6	45.0
31st	41.4	42.1	45.8	45.2	44.2	44.2	42.2	38.4	40.4	43.1	45.4	45.2	50.2	51.2	52.0	52.2	51.2	48.8	47.2	46.4	47.1	46.6	46.6	46.7
Means	44.35	44.99	45.43	45.40	44.73	43.30	40.63	36.97	35.58	36.13	40.90	45.60	51.05	55.35	56.89	55.79	53.35	50.02	47.52	46.27	45.96	45.27	44.50	44.99
Normals	44.84	45.21	45.43	45.60	45.39	43.52	40.98	37.62	35.21	35.69	40.43	45.62	51.07	55.18	57.05	55.64	53.35	50.02	47.52	46.73	46.56	46.16	45.60	45.16

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF JANUARY 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11
1st	44.7	45.9	46.2	45.7	46.2	45.5	42.7	39.6	39.4	36.1	38.5	41.5	45.5	50.1	51.7	53.1	53.7	53.2	52.5	50.2	49.2	48.7	39.9	45.4
2d	45.5	42.7	43.4	42.8	43.3	41.2	41.7	41.8	36.1	39.3	41.0	44.4	51.1	53.1	53.9	54.5	55.1	53.3	52.3	46.7	45.2	46.4	47.1	45.4
3d	45.4	44.6	45.2	43.2	44.6	42.4	41.2	38.2	40.2	39.7	43.1	45.2	46.9	48.9	49.2	50.2	50.4	50.2	49.2	47.2	48.0	48.2	46.3	45.3
4th	45.1	44.4	44.2	45.3	44.2	44.1	43.2	42.2	41.1	42.9	46.2	49.8	52.8	52.2	51.5	52.4	51.5	50.9	49.8	48.2	45.2	45.2	45.3	45.2
5th	44.8	42.1	43.5	43.2	43.2	43.2	42.2	41.0	39.3	38.4	41.5	45.1	47.9	48.4	49.3	49.7	48.5	48.2	48.3	49.2	46.2	47.1	46.2	43.9
6th	44.5	44.2	45.9	45.5	45.2	43.5	42.3	41.4	40.1	41.3	44.0	49.2	52.1	53.7	55.1	53.0	50.7	48.2	47.5	47.9	47.4	49.0	47.4	46.6
7th	46.8	45.2	39.3	41.0	42.1	39.8	35.8	32.9	33.2	37.2	41.8	50.9	54.1	56.3	54.2	51.0	48.2	47.2	46.4	46.2	47.3	47.7	47.3	46.7
8th	46.4	45.5	46.4	45.4	45.2	44.2	42.2	39.2	37.4	38.6	43.1	48.2	54.4	57.7	56.6	54.2	51.1	49.1	47.7	46.7	47.0	47.2	47.2	46.7
9th	46.7	46.6	46.3	46.2	45.4	44.0	42.1	39.0	36.5	37.4	41.9	44.4	50.2	54.9	55.6	53.9	51.0	48.7	48.0	47.6	48.2	47.5	47.2	46.4
10th	46.2	45.5	45.3	45.1	45.2	44.3	42.2	38.7	35.9	36.1	40.1	45.8	53.1	58.2	58.4	55.9	51.6	49.2	49.0	48.7	48.0	48.1	47.3	47.0
11th	46.3	45.4	45.3	44.9	44.2	42.9	42.1	38.1	36.0	35.4	38.7	43.8	47.7	54.3	57.2	58.5	55.0	51.3	50.2	52.1	50.2	48.4	46.3	45.5
12th	41.9	38.4	35.7	38.0	34.2	36.2	36.5	38.2	36.8	39.9	43.0	42.6	54.3	57.3	59.5	58.5	55.3	52.5	48.0	47.2	46.3	45.4	46.4	46.4
13th	46.2	46.0	45.7	45.7	45.4	43.9	42.0	39.4	35.9	36.2	38.5	42.0	48.2	52.5	54.2	53.3	52.1	50.0	48.5	47.2	45.2	46.2	46.2	46.2
14th	45.7	46.1	46.0	45.8	46.2	46.1	46.2	43.2	38.9	36.0	36.7	41.2	48.3	55.3	—	55.9	52.9	50.2	49.2	48.3	47.8	47.2	47.2	45.7
15th	44.5	45.9	45.8	45.3	45.2	43.3	41.2	38.2	36.0	36.1	37.4	40.9	46.2	51.6	53.2	53.7	52.4	50.3	48.4	47.7	47.4	46.2	47.0	46.3
16th	46.1	45.8	45.7	45.8	46.1	45.4	44.3	37.0	34.9	34.2	—	—	45.0	56.2	57.4	57.2	55.8	54.8	53.7	51.2	50.7	49.1	47.0	46.2
17th	42.0	42.3	41.4	41.2	44.6	41.3	40.2	41.3	38.4	36.4	37.5	40.1	44.2	48.0	50.7	51.1	50.4	50.3	49.5	49.2	48.4	47.4	46.3	46.2
18th	45.4	45.2	42.9	44.1	44.5	43.7	43.1	41.3	37.4	39.9	44.4	49.2	54.2	57.3	56.3	53.8	50.0	48.0	38.5	49.7	49.2	48.2	47.7	47.2
19th	46.2	45.4	45.1	45.0	44.6	44.0	42.4	40.5	37.2	37.4	41.3	46.2	50.7	52.9	53.1	52.6	50.4	49.2	48.3	49.9	50.4	47.3	48.1	46.4
20th	45.4	45.2	44.6	43.5	42.6	43.5	43.2	39.5	40.4	41.2	41.2	51.2	53.2	56.2	56.8	54.2	50.3	48.7	48.2	46.5	47.7	47.4	46.3	44.2
21st	44.2	44.3	45.4	44.2	45.4	43.9	42.9	38.6	35.9	39.7	43.0	50.1	51.2	52.1	53.0	49.7	47.5	46.3	44.4	45.4	47.4	47.2	46.4	46.6
22d	46.1	47.7	43.8	43.3	46.1	43.1	45.3	44.6	36.9	35.2	35.7	43.4	48.0	56.4	57.2	56.8	54.5	48.7	46.7	45.2	44.6	45.3	46.7	46.2
23d	47.2	47.4	48.0	50.2	48.0	46.2	44.2	39.2	35.3	40.0	43.5	46.7	50.6	51.8	54.2	53.2	51.2	49.0	46.3	45.6	45.4	47.1	46.1	46.2
24th	46.6	47.2	47.8	48.2	47.2	46.2	43.4	39.5	35.5	33.6	38.4	44.7	52.2	59.2	62.3	60.2	56.0	51.2	47.2	45.4	46.2	47.6	47.4	48.2
25th	48.2	48.2	48.2	48.1	48.2	45.2	42.4	39.9	36.5	37.1	42.2	46.1	53.0	56.3	58.2	56.9	53.0	50.2	47.4	46.4	46.6	45.5	44.1	45.2
26th	45.5	45.5	44.2	43.1	42.3	44.5	48.9	39.3	36.3	35.6	39.2	49.0	54.0	57.2	58.0	56.8	51.6	48.6	47.9	48.2	48.4	47.9	45.1	46.0
27th	47.3	47.2	46.2	46.2	46.2	45.2	43.1	40.7	40.0	38.3	40.5	42.9	44.8	51.2	54.2	54.2	52.2	49.2	47.7	45.5	46.3	47.3	46.2	47.0
28th	46.2	47.2	46.3	43.2	46.1	49.8	44.4	36.2	31.2	31.2	34.2	44.0	50.0	55.0	59.8	60.1	56.9	55.6	53.2	52.7	51.2	50.2	37.2	45.2
29th	46.4	47.0	46.8	45.6	46.1	46.1	43.1	39.9	38.2	37.1	40.5	46.4	52.6	57.1	59.3	59.3	56.7	54.2	51.4	49.2	47.4	49.2	48.2	47.8
30th	43.2	47.2	45.7	45.8	45.9	44.9	42.4	39.4	37.7	37.4	40.4	45.3	50.0	53.7	59.9	54.8	53.4	52.3	49.5	46.1	47.2	47.1	41.2	44.1
31st	44.9	44.2	46.2	46.7	46.7	45.7	43.3	39.6	37.0	34.3	38.3	42.3	48.7	53.9	57.2	56.2	53.4	49.4	47.2	48.1	48.2	48.2	—	47.3
Means	45.53	45.34	44.92	44.75	44.79	43.91	42.59	39.62	37.15	37.39	40.53	45.42	50.17	54.16	55.57	54.67	52.34	50.24	48.45	47.92	47.54	47.43	45.94	46.09
Normals	45.53	45.57	45.43	44.80	45.14	43.98	42.82	39.66	37.35	37.42	40.73	44.99	51.13	54.78	56.08	54.46	52.35	49.90	48.45	47.76	47.54	47.43	46.67	46.16

MAGNETIC DECLINATION DURING THE MONTH OF FEBRUARY 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4 h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	46.6	46.2	45.5	44.2	45.4	43.4	43.3	40.2	39.1	41.0	43.2	46.2	49.4	52.9	54.9	55.2	54.2	51.8	49.5	47.7	47.2	47.7	47.2	46.3
2d	46.9	46.6	46.4	46.2	46.9	45.9	43.5	40.2	39.5	38.4	42.1	—	53.0	56.1	58.2	57.2	54.2	51.0	49.6	48.2	49.2	49.2	49.0	48.5
3d	48.2	48.0	49.2	46.2	46.2	45.4	43.9	41.7	40.1	40.3	43.3	46.3	50.7	54.2	56.3	56.0	53.3	49.8	47.4	47.2	47.2	45.1	46.2	46.4
4th	47.2	48.0	46.5	46.4	46.5	46.0	43.3	39.9	38.9	37.3	41.8	47.4	53.2	57.9	60.7	59.7	57.2	54.0	50.0	47.3	47.2	47.0	48.3	48.3
5th	46.6	46.3	46.7	47.2	47.2	46.5	45.3	42.8	40.0	40.0	43.2	47.4	52.2	56.2	58.2	57.3	55.4	53.7	51.2	48.9	46.4	44.2	48.1	47.3
6th	47.2	45.3	44.2	46.4	48.0	47.0	44.4	41.1	39.4	42.2	46.2	51.3	55.3	59.7	61.3	60.2	57.4	54.1	50.2	48.2	48.4	48.2	48.9	48.2
7th	47.5	47.3	47.3	47.0	46.8	46.2	44.0	40.1	37.6	38.1	42.0	48.4	54.0	57.6	58.6	57.0	55.1	51.6	49.3	48.8	50.0	48.8	48.3	48.2
8th	47.9	47.1	46.7	46.5	46.5	46.2	43.2	41.0	39.3	40.8	46.7	50.2	53.4	55.8	58.2	57.3	55.1	51.2	48.2	48.1	48.6	48.1	49.2	48.2
9th	48.1	47.4	47.2	47.2	47.1	46.2	44.1	40.4	39.3	38.9	43.0	48.7	53.7	59.2	62.9	60.2	57.2	52.2	49.7	49.2	49.7	48.4	49.1	48.1
10th	47.4	46.7	46.5	45.9	46.8	45.6	43.2	38.4	35.9	37.2	41.3	47.2	54.2	59.2	62.1	60.9	56.2	52.1	49.2	47.7	48.2	48.2	48.4	48.0
11th	46.6	46.2	47.6	47.3	47.4	49.1	43.0	39.2	37.9	34.9	37.7	43.5	47.6	53.2	56.8	58.3	56.2	54.0	51.3	49.3	48.4	46.3	47.4	47.4
12th	47.8	47.6	48.2	48.2	48.2	46.4	44.2	38.8	36.9	35.1	37.4	43.8	51.3	58.0	61.9	61.7	58.3	55.0	51.2	48.7	46.2	47.5	48.9	48.4
13th	45.0	42.4	39.8	38.8	42.1	44.2	43.3	44.2	36.5	35.2	37.4	43.9	50.2	56.2	60.2	60.2	55.4	52.2	50.2	50.2	50.1	48.4	41.4	45.2
14th	44.2	45.1	43.3	46.6	46.8	46.2	43.2	40.4	38.4	39.0	41.1	45.5	51.2	55.2	58.8	59.1	56.9	53.6	51.0	49.3	49.2	48.2	48.2	47.7
15th	47.8	47.5	47.3	47.3	46.9	46.5	43.3	39.9	37.5	37.1	41.2	47.7	54.4	58.2	59.3	58.3	—	51.6	49.6	49.2	49.1	48.7	48.4	47.8
16th	47.2	45.7	45.1	47.3	43.3	42.3	40.7	36.1	39.4	40.5	43.5	52.1	53.8	50.4	58.1	58.2	55.1	51.3	49.7	50.1	50.6	49.7	49.4	48.5
17th	47.7	47.2	47.0	45.9	45.3	44.7	41.3	38.5	37.5	42.6	44.7	51.2	54.8	55.9	55.9	53.7	52.2	49.3	46.3	45.7	44.3	46.2	44.2	45.7
18th	41.2	47.3	41.0	42.1	45.3	43.7	39.2	36.2	35.8	39.2	46.3	52.1	55.4	57.0	56.8	55.3	53.7	50.2	48.7	48.2	48.2	47.2	47.7	47.7
19th	48.6	46.8	48.6	47.6	46.2	46.2	44.3	40.3	40.7	37.3	40.9	50.4	50.3	55.2	55.3	55.0	54.2	51.6	48.0	46.5	49.2	44.0	42.7	42.2
20th	44.2	48.2	47.5	47.2	49.2	52.2	47.3	43.1	41.9	41.2	47.3	48.9	51.8	52.8	54.3	53.7	51.4	50.2	49.2	47.9	46.6	40.7	47.0	47.6
21st	43.2	46.3	47.7	47.1	46.9	49.2	47.1	42.5	40.3	40.2	44.7	51.5	52.4	54.2	54.8	54.4	52.3	50.2	48.5	47.7	48.1	39.7	41.1	33.2
22d	44.2	41.2	45.4	33.5	41.5	51.2	52.2	49.0	45.8	47.2	48.6	49.1	53.0	53.1	54.7	51.4	49.7	51.5	46.0	42.2	45.2	47.5	41.2	43.3
23d	43.2	44.2	43.9	45.2	42.3	47.0	44.2	42.3	41.9	39.1	42.2	49.4	53.5	56.2	56.4	55.3	53.2	50.3	47.9	48.2	48.3	48.7	48.3	48.2
24th	48.2	48.0	48.0	48.2	47.7	47.2	46.2	40.7	39.0	38.1	42.3	49.2	54.0	56.9	58.2	57.9	56.1	52.7	48.7	48.5	48.5	48.1	47.4	47.4
25th	48.2	48.1	47.6	48.4	47.2	47.1	44.2	41.2	40.0	41.2	44.0	48.8	53.2	55.2	56.7	57.1	54.5	51.3	49.2	48.1	46.2	47.3	46.3	47.3
26th	47.2	47.0	46.2	46.1	45.9	46.2	44.0	39.6	39.0	39.1	43.1	46.6	51.0	53.4	55.4	55.2	52.5	49.7	48.0	48.5	48.2	48.2	47.3	46.7
27th	47.2	47.2	47.1	46.5	47.3	46.1	43.4	40.2	36.2	35.9	40.9	43.9	51.0	56.2	60.0	61.6	57.3	53.5	50.2	48.5	48.2	47.6	47.7	47.2
28th	46.4	46.1	45.0	46.1	46.8	46.8	45.2	41.5	38.2	37.2	38.8	44.2	51.5	57.3	61.2	62.0	60.2	56.3	52.7	48.7	47.7	48.3	46.5	47.1
29th	47.1	47.1	47.0	47.1	46.5	47.2	45.2	42.1	39.0	36.3	35.1	39.2	46.1	55.2	61.2	62.1	59.2	55.7	52.1	51.0	46.2	47.7	48.1	47.7
Means	46.51	46.49	46.19	45.85	46.21	46.48	44.12	40.74	39.01	38.99	42.41	47.65	52.26	56.16	58.22	57.64	55.13	52.13	49.41	48.20	47.95	47.24	46.96	46.68
Normals	46.70	46.67	46.62	46.57	46.38	46.09	44.00	40.78	38.69	38.69	42.89	47.96	52.66	56.37	58.05	57.86	55.15	52.13	49.41	48.41	47.95	47.76	47.82	47.34

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF MARCH 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	47.2	47.3	47.1	48.0	46.4	47.4	46.5	43.7	40.4	39.4	40.2	45.2	51.4	55.7	58.7	59.2	57.0	53.4	51.7	50.7	49.8	49.1	48.2	48.1
2d	48.0	47.8	47.6	47.7	47.6	47.3	45.5	42.2	38.2	37.8	43.1	50.3	57.4	60.4	59.7	58.1	54.3	51.4	48.4	48.9	49.0	48.7	48.3	47.2
3d	46.5	44.3	44.2	45.4	46.3	46.2	45.0	40.9	39.2	39.1	42.3	48.6	55.0	58.0	59.2	60.2	56.5	51.2	48.2	50.2	49.6	49.3	48.3	47.7
4th	47.3	46.2	46.4	47.0	46.4	46.2	45.1	41.7	37.9	38.5	42.2	48.3	55.2	58.7	58.2	56.5	53.2	49.2	47.6	49.2	51.0	49.4	48.7	48.1
5th	47.4	46.9	46.0	44.2	43.3	43.1	44.7	39.3	35.6	39.5	42.8	49.3	55.7	57.4	57.2	55.4	54.2	52.4	49.7	51.2	49.1	47.6	41.3	47.4
6th	48.2	47.3	47.3	47.3	46.0	44.7	43.3	38.5	36.9	39.3	42.3	47.2	54.4	58.8	59.9	58.7	54.2	71.2	50.0	49.7	49.9	50.1	49.2	46.4
7th	47.3	47.0	47.2	46.6	45.5	45.0	42.2	40.2	38.1	39.4	42.3	49.3	54.9	59.1	58.3	55.2	52.2	49.7	48.8	49.4	47.7	48.6	48.3	47.4
8th	47.3	47.2	47.0	46.3	45.7	45.1	43.2	40.1	37.4	37.0	42.7	48.2	54.0	57.6	52.1	56.8	53.0	50.3	50.1	49.1	48.7	45.3	44.3	43.6
9th	43.4	45.2	48.2	43.0	46.4	43.7	41.7	38.2	39.7	38.5	39.5	48.1	53.9	57.2	57.7	54.9	51.0	48.9	47.9	46.1	47.2	47.3	47.2	47.2
10th	47.3	48.0	47.3	46.7	45.5	45.7	44.3	40.7	38.2	36.7	42.0	46.9	54.2	58.0	58.3	56.0	52.2	49.1	48.2	46.2	48.1	45.2	45.2	45.9
11th	48.2	47.6	48.2	47.0	46.3	46.6	44.3	41.6	39.2	38.3	42.3	47.5	53.9	57.3	57.4	56.4	53.2	49.2	46.3	47.3	47.3	47.3	47.3	47.0
12th	46.2	47.2	47.2	46.4	46.2	45.7	44.1	42.2	40.0	38.7	41.5	47.0	53.5	58.2	57.6	56.2	53.2	49.3	47.4	47.5	48.2	48.6	47.8	47.5
13th	38.2	44.3	46.2	45.1	46.3	41.4	41.3	41.2	40.2	41.3	45.2	51.2	52.2	54.4	55.3	56.1	53.7	51.5	46.2	48.1	48.1	47.5	46.2	44.2
14th	44.4	43.4	45.0	47.5	42.2	42.3	42.2	44.5	44.2	46.3	46.7	47.7	49.7	51.4	—	52.7	52.5	52.6	47.2	49.1	49.1	48.2	44.4	45.2
15th	41.2	44.1	45.6	46.7	46.4	48.7	44.6	44.5	43.9	44.4	45.2	48.3	50.9	51.7	53.3	53.7	51.2	50.2	48.0	45.0	46.0	46.2	43.0	49.7
16th	48.2	45.2	48.3	45.8	45.3	52.2	46.2	43.7	41.9	40.7	43.3	45.5	51.2	54.1	56.2	56.2	52.3	49.2	48.0	48.2	47.2	45.1	45.4	45.9
17th	46.0	47.4	47.2	48.3	47.0	46.3	46.2	44.2	40.2	42.2	45.1	48.6	52.7	55.2	55.3	55.2	54.0	50.6	49.0	48.1	42.2	45.2	46.2	40.7
18th	32.3	45.3	42.5	46.3	47.3	43.2	45.4	51.5	48.8	43.5	43.4	47.4	49.7	53.1	53.6	52.4	54.2	50.2	43.2	49.2	48.3	44.0	33.1	43.1
19th	38.1	41.1	40.0	43.4	37.2	41.7	49.1	43.6	40.2	39.0	39.3	43.0	45.3	47.8	50.6	51.2	52.6	51.2	51.5	38.3	44.1	43.6	39.7	39.3
20th	42.9	48.2	45.2	41.2	50.2	46.2	50.2	50.4	46.2	45.2	44.8	46.2	47.3	49.2	51.2	50.7	49.2	49.1	49.0	45.7	47.2	47.3	47.2	47.2
21st	46.7	46.6	46.5	46.1	48.3	46.4	46.2	43.3	46.2	41.5	40.1	42.2	48.2	52.2	54.9	55.9	53.2	50.0	48.1	43.0	47.1	46.2	45.0	44.2
22d	42.5	40.8	46.6	46.4	47.0	47.2	47.3	44.5	42.8	39.9	40.7	43.6	49.2	54.4	57.0	57.0	54.2	45.9	47.2	49.1	47.9	47.3	46.2	44.9
23d	43.2	46.7	48.2	43.1	44.9	46.1	47.2	44.2	41.6	41.1	42.3	47.3	53.2	56.9	56.2	55.1	53.1	—	48.2	47.5	46.7	47.3	46.2	40.6
24th	45.2	47.2	47.2	47.2	48.2	49.2	48.8	45.1	42.0	38.4	38.5	44.7	50.3	55.3	55.9	54.2	52.2	50.2	49.2	48.2	47.7	47.2	47.2	46.7
25th	46.2	46.1	46.3	46.5	46.1	47.5	46.3	44.2	40.2	38.2	41.0	44.5	49.3	53.1	56.0	55.5	53.2	49.9	48.0	48.2	47.2	47.2	46.2	46.7
26th	46.6	46.3	46.3	46.5	46.0	46.2	44.9	42.1	39.5	38.2	40.9	46.3	52.3	55.9	57.2	56.5	53.7	50.2	49.2	49.3	48.7	48.7	47.7	47.7
27th	46.9	46.8	47.2	46.2	47.0	44.8	46.2	43.2	39.7	36.2	36.9	44.3	52.2	58.3	60.2	58.6	58.1	55.2	50.1	49.4	48.6	51.4	46.9	46.5
28th	47.1	46.1	48.8	47.2	47.2	46.2	46.1	43.5	41.2	41.3	41.7	47.1	53.2	57.2	59.7	68.2	66.3	55.2	56.1	61.2	47.4	30.2	46.2	49.4
29th	46.4	45.2	44.2	45.7	43.7	43.2	41.1	40.3	38.2	38.3	43.3	47.7	51.0	54.1	57.4	58.0	52.2	55.7	43.9	46.2	34.2	23.2	37.4	33.2
30th	23.2	44.3	61.2	47.2	39.0	50.7	54.6	56.6	43.8	41.5	43.8	43.2	45.7	48.7	48.2	51.2	50.2	49.3	47.9	47.7	46.8	45.2	44.3	44.1
31st	43.0	46.3	47.2	46.2	50.2	48.3	46.3	45.2	39.6	39.6	46.6	47.9	53.7	56.0	56.2	53.7	51.2	49.2	44.5	48.2	48.1	47.3	46.3	
Means	44.28	45.92	46.88	46.07	45.84	45.95	45.49	43.39	40.86	39.96	42.10	46.82	51.77	55.26	56.28	56.10	53.68	50.76	48.50	48.11	47.36	45.99	45.48	45.46
Normals	46.13	46.26	46.62	46.23	46.37	45.71	45.01	42.69	40.18	39.39	42.12	46.97	52.20	55.81	57.17	56.22	53.23	50.75	48.58	48.18	48.00	47.32	46.63	46.42

MAGNETIC DECLINATION DURING THE MONTH OF APRIL 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	46.2	45.1	47.3	47.2	47.2	48.3	46.4	43.9	41.0	39.2	39.1	44.4	49.2	54.5	57.2	57.6	55.5	49.7	49.2	49.3	48.2	47.5	47.2	47.2
2d	46.5	46.6	47.1	47.1	47.2	46.9	47.2	46.2	44.1	39.2	40.2	44.2	49.0	53.4	55.9	54.5	52.6	50.9	50.2	49.2	50.2	47.2	48.2	47.2
3d	47.0	46.3	47.3	44.9	45.3	45.9	45.9	42.8	42.9	46.7	47.2	47.2	48.7	51.9	53.8	53.3	54.2	53.7	53.7	52.0	50.8	47.1	39.4	42.6
4th	41.2	44.1	44.2	47.0	45.2	45.8	47.2	44.1	44.2	43.2	44.7	46.2	49.3	52.3	52.7	53.1	53.2	52.2	51.2	50.2	45.2	49.2	47.3	44.4
5th	44.7	45.2	44.3	47.2	45.3	—	46.7	44.2	41.4	42.2	42.7	45.2	49.2	53.2	54.3	55.1	53.3	49.9	51.9	50.4	48.9	48.2	48.2	45.7
6th	45.1	46.5	46.2	47.2	46.2	46.9	47.1	45.3	42.8	41.2	41.1	44.2	50.4	54.9	57.0	55.8	53.3	50.6	49.4	50.2	47.4	47.2	47.2	46.6
7th	47.2	47.3	47.0	47.2	45.7	46.4	44.7	43.5	41.4	38.0	40.4	42.6	49.4	55.0	58.2	56.7	52.7	49.1	49.2	49.7	48.4	47.7	47.2	47.2
8th	46.2	45.9	45.1	46.0	46.7	46.3	46.1	44.1	41.8	40.8	42.3	45.5	50.2	53.8	54.2	53.8	52.7	49.4	48.8	48.5	48.2	43.2	45.9	46.2
9th	47.2	47.1	47.2	47.1	47.2	46.2	46.2	44.2	40.8	40.4	42.3	47.2	52.2	55.1	57.0	57.2	57.2	56.2	56.2	58.2	47.7	47.3	44.3	44.3
10th	43.4	34.2	36.7	40.2	51.2	51.4	47.0	42.3	39.5	44.1	42.4	44.5	46.5	49.7	52.2	52.9	51.4	47.0	48.8	49.2	48.2	44.2	43.6	41.2
11th	44.9	45.1	50.0	51.2	49.1	47.2	46.4	44.2	45.8	42.6	40.5	42.9	46.1	50.1	53.2	54.2	52.5	50.2	49.2	49.2	35.2	44.7	45.3	45.3
12th	49.2	49.2	45.4	45.8	47.0	47.2	53.2	47.4	43.4	45.2	42.0	43.3	46.3	50.0	53.5	54.2	49.6	49.2	49.6	45.1	43.3	45.4	42.7	46.2
13th	40.6	43.3	46.1	40.2	46.7	46.6	49.7	46.0	41.3	45.2	40.5	47.1	50.2	52.2	56.2	50.6	49.2	49.2	44.2	48.3	46.2	42.8	45.2	46.2
14th	46.3	48.2	45.5	44.9	47.5	40.4	48.7	49.4	48.1	45.0	47.2	45.2	50.3	54.2	64.4	—	54.6	48.7	49.7	45.3	42.1	46.3	47.2	46.3
15th	49.7	51.3	50.3	49.1	51.3	50.7	48.4	44.7	41.1	38.7	41.0	42.7	48.2	50.5	53.3	52.8	51.2	48.2	44.2	47.2	46.8	44.5	45.0	46.2
16th	46.7	47.7	51.8	48.1	47.2	46.4	48.2	46.2	46.9	41.2	40.2	44.0	48.1	52.7	55.2	55.2	53.2	43.1	50.7	46.4	46.2	45.4	42.9	42.4
17th	40.2	42.2	49.2	43.1	45.2	47.2	46.0	45.7	41.5	40.4	41.1	43.8	48.2	51.2	53.2	55.2	53.2	49.2	49.3	48.2	48.2	47.2	46.7	46.2
18th	46.6	47.2	46.9	47.2	47.0	47.0	47.7	45.1	43.4	42.1	41.2	44.2	48.2	51.6	52.8	53.0	52.2	49.5	49.0	48.2	48.0	48.3	48.0	42.1

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF MAY 1960.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	41.8	43.2	44.2	42.5	44.1	45.5	45.1	45.2	43.8	41.0	40.5	42.2	44.4	49.1	50.2	54.9	55.3	52.4	53.4	49.6	47.2	44.9	42.9	45.2
2d	44.8	44.4	45.7	46.2	46.9	45.2	45.5	45.5	44.0	41.8	39.2	39.8	41.7	45.3	48.3	50.6	52.6	50.6	48.1	41.4	47.0	46.2	45.6	45.6
3d	45.2	45.2	45.3	46.2	45.3	45.2	45.5	45.1	43.3	41.1	40.3	40.8	44.6	47.5	50.2	51.0	50.4	49.2	47.3	47.2	46.2	46.3	46.2	46.1
4th	45.4	45.7	45.9	45.9	45.5	45.7	45.2	44.2	42.2	40.3	40.3	41.6	44.8	50.0	51.6	50.7	—	48.7	48.1	47.0	46.3	46.3	46.0	45.4
5th	45.4	45.9	46.2	45.3	45.1	45.0	44.7	44.2	42.7	40.9	39.8	41.5	45.0	49.2	52.2	52.8	53.3	50.4	53.2	48.6	47.9	43.0	38.2	43.2
6th	42.4	44.6	38.8	43.7	44.1	44.1	42.9	42.2	39.5	40.2	39.1	41.2	48.0	49.6	51.7	52.1	54.3	52.2	48.2	46.2	45.7	46.2	49.3	37.9
7th	42.0	37.3	45.7	44.9	44.2	48.9	46.2	46.6	47.2	46.0	45.6	42.9	45.5	48.2	50.2	52.1	48.2	48.0	46.2	45.3	44.2	44.2	42.2	42.2
8th	43.2	46.2	45.0	46.2	47.1	45.2	44.2	45.1	44.2	42.9	41.4	41.4	43.2	46.2	49.5	49.5	48.9	47.6	47.1	46.4	46.2	46.1	45.5	45.4
9th	45.6	45.6	46.2	46.2	45.7	46.0	45.3	45.2	43.0	40.8	39.9	41.2	45.2	48.5	50.8	51.3	50.9	48.2	47.3	46.7	46.4	43.8	43.7	43.8
10th	44.2	44.2	45.1	44.2	45.2	45.0	45.7	44.5	43.4	41.3	39.9	42.3	45.0	47.7	48.7	52.2	51.2	49.2	45.0	47.2	45.2	42.3	42.9	40.3
11th	42.3	44.4	46.2	46.7	45.9	46.3	45.2	45.3	43.2	42.1	41.8	41.9	45.3	48.2	55.0	52.2	50.2	48.2	46.2	43.3	45.9	44.4	41.2	27.2
12th	42.0	45.0	44.7	44.9	46.4	48.9	51.5	45.5	44.9	43.2	40.2	42.2	44.6	46.0	49.0	50.6	51.8	48.3	46.6	46.1	44.4	43.2	41.2	44.2
13th	45.2	46.1	45.2	44.7	44.3	46.9	45.7	45.2	44.2	42.5	42.4	44.1	46.2	48.1	51.3	50.1	50.3	47.3	47.3	46.3	45.0	42.9	44.7	43.0
14th	44.1	44.1	45.5	46.8	45.3	46.7	45.3	45.6	44.2	42.0	41.5	42.5	44.2	42.3	48.3	49.2	48.6	47.7	48.2	46.2	44.2	43.8	43.5	43.4
15th	45.2	45.2	45.2	46.4	43.2	45.2	45.2	44.2	42.7	40.3	40.2	41.2	46.1	47.6	50.2	51.2	50.2	47.2	46.2	45.4	45.0	45.2	45.1	45.2
16th	45.3	45.0	45.1	45.2	45.2	45.6	44.8	45.6	43.2	42.8	42.3	41.2	44.3	48.3	49.7	51.7	49.1	47.4	46.7	45.5	45.2	45.2	45.2	45.2
17th	44.7	45.2	45.2	45.2	45.7	45.3	45.2	45.8	45.4	41.4	40.9	41.7	44.7	46.7	49.2	50.0	49.1	46.3	45.7	45.4	44.9	44.3	41.7	44.0
18th	44.2	45.1	45.2	45.0	47.4	51.8	45.5	45.7	43.9	41.3	40.3	43.0	48.3	50.0	51.5	52.2	49.2	47.2	45.4	46.2	45.4	45.3	45.3	45.0
19th	44.1	45.1	45.2	45.2	46.2	47.2	44.5	44.4	43.5	41.9	40.6	41.4	44.6	47.8	49.2	50.6	49.4	48.2	47.1	46.2	45.4	44.9	44.0	45.2
20th	45.2	46.2	46.2	47.5	50.9	44.9	44.0	44.3	45.4	42.1	40.2	41.4	43.7	47.3	50.3	51.2	49.1	47.9	47.1	46.1	45.6	45.8	40.6	44.5
21st	43.4	41.0	42.0	42.4	45.0	44.4	44.1	44.2	44.1	42.4	41.1	42.2	44.4	48.0	50.7	51.2	49.9	47.6	47.5	48.8	45.7	45.1	42.7	44.1
22d	45.4	44.7	45.2	45.2	45.0	44.9	44.5	45.2	44.4	43.3	42.1	43.1	44.9	47.2	49.2	50.1	49.5	48.3	47.3	47.1	47.2	46.2	45.3	45.0
23d	45.2	45.2	45.4	45.3	44.2	46.0	43.4	44.7	43.1	41.7	44.2	45.5	45.2	46.3	49.2	50.2	49.0	46.7	46.2	45.9	45.9	45.7	45.1	44.6
24th	43.3	34.1	34.2	43.3	39.7	45.7	45.0	45.5	45.9	46.8	41.2	44.0	45.7	48.2	48.1	50.2	49.3	46.2	45.7	46.1	44.5	42.8	41.0	41.7
25th	40.6	39.9	45.2	39.2	41.2	41.4	46.4	48.4	44.2	44.4	42.4	43.3	45.1	47.2	50.5	50.2	50.9	46.8	48.0	47.3	47.1	45.6	46.5	44.7
26th	40.3	43.0	43.1	42.6	40.3	47.2	40.2	46.2	47.1	45.6	44.2	44.1	44.5	47.3	50.2	50.7	50.1	48.2	47.7	48.3	47.5	46.3	42.2	45.2
27th	45.2	45.2	45.2	45.2	45.2	45.4	45.3	46.2	46.2	44.4	43.3	43.3	45.4	47.6	49.1	50.1	50.1	49.8	50.3	52.1	48.2	47.7	46.6	44.7
28th	—	37.4	42.7	44.2	—	44.6	45.4	45.5	44.6	44.7	44.2	43.2	44.2	47.1	50.9	50.2	51.2	49.9	48.3	47.2	46.2	45.2	44.5	44.5
29th	44.4	44.3	45.2	43.7	43.8	44.9	44.2	44.5	45.1	44.4	43.2	43.6	46.2	47.9	49.7	51.2	52.2	50.1	48.4	48.3	46.9	45.8	45.0	45.2
30th	44.2	44.2	45.3	45.7	46.1	45.8	46.1	46.4	46.3	45.3	44.4	43.4	45.3	47.4	49.6	50.7	50.2	47.7	47.3	47.3	46.2	46.2	45.8	45.4
31st	45.8	45.4	45.8	46.2	46.2	46.2	46.2	46.8	46.2	44.2	42.4	42.6	44.7	46.2	48.2	51.8	49.2	47.7	46.8	46.5	46.2	46.1	45.4	45.5
Means	44.00	43.81	44.55	44.90	45.01	45.84	45.10	45.26	44.23	42.68	41.58	42.39	45.00	47.55	50.08	51.06	50.46	48.43	47.56	46.71	46.00	45.06	44.15	43.63
Normals	44.00	44.79	45.11	45.09	45.17	45.64	45.04	45.26	44.39	42.68	41.58	42.39	45.00	47.72	49.92	51.06	50.29	48.43	47.17	46.71	46.00	45.06	44.18	44.40

MAGNETIC DECLINATION DURING THE MONTH OF JUNE 1960.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	44.1	45.1	44.2	45.2	46.0	45.8	45.9	46.0	45.5	47.1	43.3	43.3	45.2	47.3	51.2	51.5	50.2	48.2	47.7	46.4	46.2	46.0	46.0	45.5
2d	46.2	45.2	45.9	45.4	45.7	45.2	46.0	45.9	45.1	44.1	42.5	42.6	43.2	41.5	49.2	50.7	49.6	47.4	47.1	46.4	46.3	45.9	45.4	45.4
3d	45.3	45.3	45.2	45.2	45.3	45.2	45.2	45.7	45.2	43.8	43.2	43.4	45.0	47.0	49.3	50.3	50.0	47.0	46.2	45.6	45.4	45.4	45.3	45.4
4th	45.2	45.2	45.4	46.1	45.8	45.2	45.2	45.2	45.3	43.3	42.3	43.1	44.6	46.2	48.2	48.7	48.2	46.1	45.9	45.9	46.2	43.7	44.2	—
5th	45.2	46.2	46.7	47.3	46.7	46.2	45.0	47.6	46.2	44.2	43.2	44.0	45.0	47.2	49.2	50.9	49.2	46.9	47.2	46.2	45.2	45.3	44.3	45.2
6th	41.5	44.5	46.2	46.2	46.2	46.2	46.8	45.9	45.5	44.4	43.1	42.7	44.1	46.9	45.6	45.4	48.4	47.2	47.2	46.1	44.1	43.7	45.6	45.3
7th	45.8	46.2	46.5	46.7	46.5	46.2	45.9	46.3	46.2	45.2	43.4	42.4	44.3	47.3	50.3	49.9	48.2	47.6	46.2	46.3	45.1	45.3	44.2	43.0
8th	43.2	50.2	46.0	46.2	46.2	46.2	46.3	46.3	50.0	48.2	44.3	43.3	43.6	—	50.7	52.1	50.2	47.2	47.2	46.5	41.6	45.1	44.3	44.7
9th	45.1	45.4	45.7	46.0	45.4	46.2	46.2	47.2	—	47.2	45.3	40.0	44.2	46.3	48.7	50.2	49.7	47.5	46.4	46.4	45.1	44.3	44.2	43.2
10th	44.3	43.4	45.4	45.5	46.2	45.7	45.2	45.3	45.2	44.2	43.5	44.3	44.1	44.6	48.2	51.1	48.7	46.9	46.2	45.6	45.3	44.2	43.3	45.0
11th	38.5	43.4	44.8	45.1	45.2	45.2	44.9	44.4	44.2	43.2	42.4	45.1	46.9	45.9	48.3	49.4	50.7	48.9	45.8	47.3	45.7	42.1	39.1	34.0
12th	43.7	44.0	46.0	45.2	46.2	46.1	46.1	46.2	46.2	45.2	44.2	42.2	43.2	45.2	47.3	49.2	48.7	47.0	46.2	46.9	45.4	44.8	44.6	44.2
13th	45.4	45.2	45.4	46.2	45.5	45.3	46.7	46.2	45.3	44.2	42.2	41.4	43.3	45.8	47.2	48.2	47.7	45.9	46.2	46.1	45.2	44.2	44.2	45.1
14th	45.2	45.4	45.2	45.4	46.2	45.3	45.5	45.1	45.3	44.1	43.3	42.4	44.7	45.7	46.9	47.3	47.9	46.2	45.9	46.1	45.2	44.4	44.5	45.0
15th	45.0	45.1	45.1	45.2	45.2	45.2	45.0	45.1	44.3	42.3	41.2	41.6	43.2	43.9	46.5	47.7	49.3	47.7	46.5	46.2	45.1	45.0	44.5	45.0
16th	45.2	45.3	46.1	46.3	46.3	46.3	46.1	45.4	45.1	43.2	42.5	42.5	44.4	46.6	48.2	49.2	48.2	46.3	46.2	45.7	45.4	45.2	45.2	45.3
17th	45.3	45.5	45.4	45.2	45.0	45.1	45.2	45.3	45.3	44.2	42.2	41.4	42.3	44.3	46.6	47.5	47.7	47.2	46.6	48.0	47.2	45.2	45.2	43.7
18th	43.1	43.5	44.0	45.2	45.5	45.5	45.2	55.1	44.9	42.6	40.5	40.2	43.6	46.9	48.3	48.6	49.4	47.2	47.1	47.7	46.0	42.6	43.8	42.5
19th	41.0	43.0	42.9	44.2	44.1	45.2	47.0	47.0	45.4	43.2	41.2	41.3	43.3	46.9	47.7	51.0	47.3	46.2	46.2	45.0	45.2	44.7	44.5	45.2
20th	43.9	44.1	44.1	44.2	45.2	43.7	44.3	45.4	45.1	43.0	43.2	41.7	43.1	46.2	47.0	49.2	48.2	46.0	45.4	45.1	45.1	44.5	44.4	44.5
21st	44.7	44.7	44.7	45.0	45.2	45.4	44.3	45.1	45.3	44.4	42.6	42.4	43.1	45.1	47.0	48.3	48.0	45.9	45.2	45.2	45.3	46.2	46.7	44.2
22d	43.3	41.2	43.7	44.2	42.4	45.5	44.0	45.3	46.2	45.7	43.3	47.2	45.6	45.4	46.6	49.0	48.3	47.3	46.8	45.2	44.7	44.3	41.9	45.1
23d	44.1	44.1	45.2	44.7	44.4	44.7	44.6	44.4	45.2	44.2	43.2	42.5	45.9	—	48.2	50.2	50.9	48.2	48.1	47.2	47.2	46.2	44.7	44.2
24th	45.0	44.7	45.0	45.2	45.2	45.2	45.3	46.2	46.4	45.3	44.0	43.2	44.4	47.1	49.4	50.7	49.1	46.9	46.0	45.3	45.2	45.3	45.0	43.7
25th	44.0	44.7	41.9	44.4	44.9	45.7	45.3	45.2	45.2	43.3	41.2	41.2	42.9	47.4	51.2	48.9	51.3	49.2	48.5	47.6	45.5	44.2	44.2	43.5
26th	44.2	41.3	44.7	45.1	44.2	44.7	45.2	44.3	44.2	43.1	39.9	40.5	44.2	47.5	49.5	50.4	49.6	47.2	46.4	46.1	45.8	44.9	44.3	44.7
27th	44.2	44.2	44.3	44.7	45.2	44.9	45.0	44.6	44.2	42.0	39.7	40.3	43.8	47.1	49.2	50.9	49.2	47.2	48.2	47.3	46.2	45.4	44.6	44.2
28th	45.3	43.3	44.7	44.3	45.2	45.1	44.3	44.7	44.0	41.4	39.3	36.4	42.1	46.2	49.2	51.0	49.2	47.2	46.2	46.2	45.4	45.5	45.2	45.0
29th	44.2	44.2	44.5	43.7	43.5	43.0	43.0	44.2	46.6	45.2	45.2	45.1	45.8	49.4	50.1	50.2	51.7	48.3	46.2	45.3	45.2	45.1	44.6	44.2
30th	44.3	44.3	44.5	44.8	44.5	44.3	44.2	44.1	42.5	43.4	39.6	33.2	48.6	46.2	50.2	51.3	53.3	46.2	52.2	50.2	49.7	44.2	42.2	43.2
Means	44.18	44.70	44.98	45.27	45.30	45.32	45.30	45.49	45.35	44.16	42.50	42.35	44.26	46.18	48.51	49.63	49.27	47.14	46.77	46.37	45.54	44.76	44.34	44.11
Normals	44.38	44.51	44.98	45.27	45.30	45.32	45.30	45.49	45.18	44.16	42.50	42.39	44.26	46.36	48.51	49.63	49.27	47.14	46.59	46.37	45.54	44.76	44.52	44.47

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF JULY 1889.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	39.9	42.3	48.0	49.3	49.0	48.2	48.2	46.9	47.3	43.3	45.8	41.7	44.7	48.8	47.9	51.3	49.3	46.3	46.2	44.2	42.2	29.2	39.2	40.
2d	41.2	43.4	35.1	47.7	47.2	47.1	62.2	47.7	43.2	41.1	40.2	39.2	42.1	44.9	49.2	51.5	47.2	46.2	45.2	51.2	36.3	43.2	43.5	41.3
3d	39.2	43.2	45.2	47.0	47.0	47.2	47.2	44.3	43.3	41.3	39.1	38.8	44.8	50.2	47.0	48.2	47.3	44.3	48.2	47.2	38.2	45.2	42.2	38.7
4th	42.3	42.3	40.4	43.7	45.7	48.0	48.2	49.7	45.0	42.0	38.7	43.7	41.2	44.4	47.4	50.2	49.4	46.7	46.2	46.2	45.2	44.7	45.2	42.8
5th	44.2	45.2	45.2	47.3	51.0	47.2	44.7	45.6	45.2	44.6	38.3	40.3	44.3	44.2	53.7	50.9	48.5	44.7	48.3	43.4	45.5	43.3	26.9	29.3
6th	32.2	42.0	46.2	47.0	46.2	45.3	46.4	43.3	44.4	42.2	41.8	42.0	44.2	47.2	50.8	53.2	48.4	46.2	46.1	45.2	44.8	44.2	44.1	44.2
7th	44.3	46.2	45.7	45.2	45.2	44.8	44.2	44.1	43.1	42.2	41.2	42.0	45.0	47.5	49.2	50.0	48.2	46.2	45.4	45.2	45.2	45.2	44.2	44.2
8th	44.7	45.2	45.4	45.7	47.1	46.4	45.2	45.3	44.1	42.7	41.7	43.2	45.1	48.0	49.6	49.2	48.3	46.4	45.6	45.4	41.2	43.3	42.4	42.7
9th	44.2	44.6	46.3	45.5	44.9	45.4	44.4	44.2	44.1	42.0	41.1	41.6	45.0	48.1	50.1	—	48.6	47.0	45.2	45.3	45.3	44.4	41.9	44.3
10th	44.2	44.7	45.2	45.2	44.6	45.2	44.3	45.0	44.4	42.2	40.5	40.8	43.9	49.9	52.1	51.2	49.7	47.2	46.0	45.2	45.2	44.7	44.6	44.2
11th	45.0	45.1	44.8	45.5	45.2	45.2	44.4	44.0	41.7	41.1	39.2	42.0	44.2	46.6	47.7	48.4	47.7	46.1	45.4	45.1	44.3	44.3	44.2	44.2
12th	44.3	44.3	45.2	45.3	45.2	45.2	44.5	44.3	45.0	44.2	49.2	38.7	44.0	48.4	51.9	49.6	47.0	56.4	49.5	45.2	44.3	43.7	39.1	40.1
13th	40.3	44.0	44.2	45.8	45.9	45.2	44.7	44.3	42.7	40.9	42.3	48.1	45.1	46.2	47.2	47.5	47.9	47.1	45.6	45.1	44.4	44.0	43.7	43.2
14th	42.1	43.9	44.2	43.2	44.2	44.0	43.2	43.4	43.2	42.5	41.3	42.7	45.1	45.9	47.3	48.1	46.2	45.2	44.2	44.2	43.9	44.2	43.7	43.9
15th	43.6	43.7	43.6	44.2	44.0	43.7	43.4	43.1	43.5	41.3	40.2	41.3	44.6	47.0	48.1	48.2	47.4	45.6	44.2	45.2	45.2	44.3	44.2	44.2
16th	44.3	44.4	44.1	44.4	44.3	44.5	44.1	44.2	43.4	41.8	41.0	40.4	43.2	47.2	49.9	49.5	48.1	46.3	46.9	46.5	44.2	45.2	44.1	43.2
17th	42.1	42.2	43.4	44.2	45.1	44.2	44.3	44.2	44.1	41.3	39.8	41.6	44.4	46.9	47.6	50.2	49.4	48.0	46.0	46.5	45.2	43.9	42.4	42.1
18th	43.2	43.2	41.9	42.2	44.2	43.3	44.2	45.2	45.4	45.2	43.3	44.5	47.5	50.0	52.1	49.3	49.2	47.2	46.0	45.0	44.4	42.2	43.3	44.1
19th	43.7	43.0	44.4	44.1	44.7	44.2	42.2	43.2	44.2	41.2	40.3	44.2	45.3	46.3	51.2	51.0	51.2	49.2	47.4	44.2	31.4	45.2	43.2	43.2
20th	43.4	44.2	41.7	43.8	45.0	44.3	44.6	43.5	44.2	41.6	41.9	44.1	50.2	48.4	47.0	48.5	50.9	48.0	46.3	46.2	45.6	44.3	43.9	44.2
21st	44.2	44.2	44.7	46.0	44.1	44.1	44.1	45.2	43.2	41.9	41.1	42.6	43.6	49.4	51.3	53.3	50.1	48.3	48.7	47.4	45.0	43.0	42.3	38.9
22d	42.4	42.7	44.1	44.2	43.1	43.2	43.7	43.3	43.2	45.9	40.2	39.1	42.1	46.5	49.3	51.2	51.3	48.2	47.0	45.4	46.6	45.3	44.0	34.4
23d	41.5	44.0	43.2	44.7	44.0	43.7	44.4	43.3	42.2	41.7	40.0	40.2	42.1	46.2	48.2	49.7	49.2	46.2	46.6	47.0	45.1	44.5	44.4	44.1
24th	43.7	44.2	44.7	45.2	—	45.3	44.4	43.4	43.8	42.7	40.7	39.6	45.2	46.2	50.1	50.5	50.3	47.5	45.4	45.0	44.9	46.2	37.2	42.9
25th	42.3	44.7	43.6	45.4	44.6	45.2	44.2	44.2	44.0	42.2	41.3	42.1	43.2	45.6	50.0	52.2	50.2	47.2	45.1	45.4	44.4	44.4	44.2	44.3
26th	45.4	44.4	44.4	44.2	44.3	45.3	44.2	43.4	42.3	40.4	39.4	40.8	43.0	46.7	50.2	52.3	51.1	48.2	47.3	46.4	45.2	44.7	44.4	44.2
27th	44.2	44.8	45.3	45.1	45.4	45.0	44.2	44.6	44.2	40.3	39.2	—	43.1	46.5	50.0	52.2	50.2	45.7	46.7	46.8	45.3	45.9	44.1	43.1
28th	43.4	44.3	45.3	45.7	45.7	45.2	44.9	45.1	43.7	42.0	41.2	42.7	45.2	46.7	48.8	50.6	50.2	46.2	46.2	45.5	45.0	44.2	44.2	44.2
29th	44.2	44.1	44.4	45.0	45.1	45.2	45.2	45.2	44.1	40.7	41.2	40.3	42.5	46.2	48.1	48.9	47.9	47.2	46.1	46.2	46.3	44.9	43.3	43.7
30th	43.2	43.1	44.0	45.5	45.2	45.0	43.6	44.0	46.2	44.9	40.2	39.7	40.8	44.1	46.0	48.3	50.4	47.9	46.2	46.2	44.3	44.2	43.7	41.2
31st	43.2	44.3	45.2	45.7	45.4	45.2	44.7	44.3	46.1	43.1	40.2	40.2	41.4	45.1	47.2	48.6	48.4	45.8	—	45.0	44.2	45.2	44.2	44.2
Means	43.13	43.94	44.26	45.26	45.42	45.19	45.23	44.56	44.02	42.19	41.02	41.61	44.07	46.95	49.23	50.13	49.02	47.05	46.31	45.74	43.82	43.91	42.68	42.24
Normals	43.13	43.94	44.57	45.26	45.23	45.19	44.67	44.39	44.02	42.19	40.57	41.39	43.86	46.95	49.07	50.13	49.02	46.74	46.31	45.56	44.73	44.40	43.41	42.96

MAGNETIC DECLINATION DURING THE MONTH OF AUGUST 1889.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	44.4	44.4	44.6	44.9	45.1	44.8	44.3	44.2	43.3	40.8	39.9	40.4	43.2	45.8	48.1	49.6	48.5	46.4	45.1	45.0	44.4	44.2	44.2	44.2
2d	44.2	43.2	45.1	44.4	44.9	45.3	44.0	43.2	42.4	40.2	39.1	40.2	44.2	49.4	52.4	54.9	51.4	51.2	49.3	46.6	43.3	45.7	43.1	43.6
3d	44.2	44.3	44.2	46.1	43.7	44.2	46.5	46.4	44.5	41.5	40.1	41.4	41.7	45.5	48.3	49.8	49.2	47.2	—	44.9	44.5	44.2	44.2	42.3
4th	41.3	44.2	44.7	45.2	44.5	44.0	44.7	44.2	43.9	41.2	38.5	39.2	42.2	46.2	49.0	50.7	50.2	47.7	46.0	45.2	45.1	44.2	44.2	43.9
5th	43.3	44.3	45.3	45.2	45.1	45.2	46.3	44.2	42.2	41.2	37.8	39.2	39.2	43.5	47.2	49.7	50.3	48.3	45.9	46.1	43.2	44.2	44.1	43.2
6th	44.1	45.9	45.0	46.0	45.4	45.3	44.9	45.5	44.9	41.2	39.4	40.1	43.0	47.7	48.2	51.0	50.4	47.6	46.2	46.2	45.0	44.9	44.2	44.2
7th	42.2	43.3	43.3	47.8	45.4	46.0	45.2	41.9	44.2	38.1	40.3	41.2	38.7	46.3	51.1	44.4	51.2	44.2	50.2	46.2	38.2	45.7	44.2	—0.8
8th	38.2	43.2	48.4	47.8	46.9	46.2	45.5	42.9	43.0	44.3	40.2	40.1	40.2	42.2	45.7	48.4	49.2	47.2	45.4	44.2	43.2	46.0	36.2	37.7
9th	37.8	37.2	25.5	45.2	59.9	46.6	52.3	44.5	43.4	44.6	38.2	42.0	45.9	42.1	48.4	52.2	48.2	43.3	43.8	46.5	44.7	26.0	33.4	46.2
10th	35.2	45.3	42.2	38.4	42.2	41.7	43.2	45.9	43.2	41.4	38.9	44.3	44.3	46.3	52.0	51.6	55.3	55.7	48.2	50.2	43.6	44.4	40.3	44.9
11th	43.2	38.2	37.2	34.0	45.3	45.2	45.6	44.2	48.6	51.2	42.8	43.6	45.3	47.2	48.2	51.2	52.6	51.2	45.2	47.0	42.2	41.3	40.6	43.5
12th	43.2	44.2	44.4	45.3	44.5	43.2	46.2	49.4	41.5	38.8	36.8	39.6	43.0	45.2	47.8	50.2	44.6	44.2	34.7	40.7	41.3	43.4	33.2	26.3
13th	41.3	59.3	36.3	14.2	32.0	73.2	51.2	43.9	41.9	34.2	40.2	45.0	41.5	41.7	43.8	45.8	46.2	45.2	45.5	19.2	45.2	44.0	44.2	37.0
14th	39.2	45.3	40.1	40.4	42.1	—	44.3	49.3	44.9	42.0	41.1	40.2	39.3	42.5	46.2	48.6	48.3	47.4	45.6	43.3	43.0	43.2	43.9	44.2
15th	43.2	44.2	44.2	44.2	45.2	45.0	44.3	44.9	43.2	41.5	40.0	40.3	41.2	43.3	46.1	48.3	49.0	47.1	45.5	45.1	45.2	45.0	44.8	44.2
16th	44.2	44.5	44.6	45.1	45.0	45.1	45.1	44.5	43.5	41.0	39.1	38.2	40.3	44.2	47.2	49.9	50.1	47.8	45.4	45.3	45.0	44.7	44.2	44.2
17th	32.4	32.2	42.3	34.8	36.2	47.2	41.2	44.4	43.8	42.8	41.2	42.1	42.2	45.2	47.7	50.2	50.2	47.3	46.2	45.3	45.2	45.1	44.8	44.4
18th	44.7	44.2	44.4	44.8	44.7	44.2	44.5	45.2	44.0	42.1	40.4	40.1	40.2	42.9	47.2	49.2	49.6	48.1	46.2	45.3	44.9	42.5	43.9	44.2
19th	44.4	45.2	45.2	45.1	44.4	44.2	42.6	45.1	—	41.5	39.0	41.2	41.5	45.2	52.3	54.2	53.8	44.1	51.4	47.0	45.3	44.7	40.9	43.2
20th	43.2	42.2	36.2	41.2	44.7	43.8	43.9	42.0	43.2	41.2	39.7	38.7	39.9	44.0	47.7	49.6	49.5	47.2	45.2	45.2	44.7	45.0	44.2	44.7
21st	41.4	42.3	43.3	42.9	42.3	43.4	43.1	43.5	42.3	41.1	41.0	41.2	44.0	46.2	49.3	51.2	50.2	48.3	46.3	46.3	45.2	44.2	44.3	44.2
22d	44.2	43.6	43.3	44.0	45.4	43.2	43.7	44.9	44.2	40.2	41.8	42.1	42.4	46.2	48.9	51.2	53.2	43.2	47.0	43.2	38.1	43.1	43.2	41.2
23d	41.4	43.1	43.2	45.2	45.2	45.2	45.2	44.9	43.2	40.4	39.4	39.9	41.2	44.2	48.0	51.2	49.7	47.2	45.4	45.3	44.9	45.1	44.5	44.2
24th	38.0	42.9	44.2	44.7	44.1	44.2	41.2	—	43.7	40.9	44.1	40.4	42.9	45.9	48.4	50.2	56.2	47.4	45.0	41.8	44.2	44.2	44.3	44.2
25th	43.6	42.0	41.9	44.8	45.3	43.4	51.2	49.2	44.3	40.2	40.3	38.2	40.4	42.8	46.1	47.9	48.0	46.2	45.2	44.7	44.7	44.4	43.2	43.7
26th	43.2	43.9	43.7	44.1	44.9	44.9	45.2	41.9	42.1	39.2	37.4	39.3	41.2	45.1	47.4	48.5	48.1	46.3	45.2	45.0	43.3	42.5	42.1	44.0
27th	43.8	43.8	44.2	44.2	44.2	44.2	44.2	42.3	40.3	39.3	37.3	39.1	40.6	45.4	48.9	50.2	49.1	47.7	45.4	45.2	44.7	44.0	45.0	43.4
28th	42.4	42.7	44.8	45.2	44.7	44.3	45.8	44.0	42.1	40.2	39.2	38.9	41.2	45.2	47.6	48.7	49.2	47.4	45.4	45.3	45.2	—	—	—
29th	—	—	—	—	—	—	—	44.4	43.2	40.4	39.0	38.0	41.0	45.0	49.2	49.5	48.4	47.3	46.0	45.2	45.2	45.0	44.2	44.1
30th	43.2	39.2	43.8	44.1	43.9	44.4	43.4	43.2	42.5	41.2	40.3	41.0	41.2	44.7	49.0	47.7	47.2	48.1	47.0	45.9	44.9	44.7	41.9	41.5
31st	32.4	42.3	43.2	44.1	44.4	42.4	42.5	41.8	41.7	52.2	33.3	38.5	39.9	42.9	45.3	45.8	45.3	46.1	44.9	44.5	44.3	44.0	43.6	43.2
Means	41.58	43.29	42.56	42.79	44.39	45.52	45.14	44.73	43.32	41.49	39.81	40.07	41.71	44.81	48.15	49.73	49.56	47.37	45.79	44.42	44.03	43.65	42.61	41.30
Normals	43.06	43.53	43.73	44.14	44.57	44.53	44.43	44.22	43.14	41.02	39.81	39.90	41.71	44.65	48.15	49.57	49.53	47.10	45.99	45.09	44.43	44.26	43.57	43.70

FLAGSTAFF OBSERVATORY.

23

MAGNETIC DECLINATION DURING THE MONTH OF SEPTEMBER 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	43.0	42.4	43.5	44.2	44.2	43.3	43.4	43.3	45.2	44.2	42.9	40.3	41.2	43.2	45.1	46.3	46.5	46.6	45.1	43.4	43.1	43.2	43.2	43.3
2d	43.2	43.2	44.3	43.4	41.9	43.2	—	48.3	40.5	39.2	39.2	38.6	41.2	45.2	47.2	48.0	48.4	46.9	44.7	44.2	44.0	42.2	42.6	43.1
3d	42.4	43.5	42.2	46.2	44.7	43.6	43.2	43.2	41.2	38.1	39.3	39.0	43.3	48.9	52.5	53.2	50.1	46.2	45.2	44.2	43.9	43.3	43.0	42.1
4th	42.4	44.2	46.0	44.3	44.3	44.4	43.7	43.2	41.0	38.2	37.7	38.7	42.2	46.1	50.3	51.2	49.1	46.5	44.7	43.5	44.6	44.3	44.2	44.2
5th	43.2	43.2	38.4	35.2	45.2	37.2	37.7	42.2	45.2	42.7	41.1	42.2	44.0	46.9	50.9	50.9	49.9	48.3	47.2	47.5	44.4	43.2	42.2	42.2
6th	41.5	41.6	43.3	44.1	43.3	43.3	42.7	42.2	40.4	38.4	40.0	40.2	42.5	46.2	50.2	50.7	49.1	46.2	45.7	44.3	44.2	44.1	43.2	41.0
7th	42.2	42.2	43.3	43.9	44.2	43.2	43.8	33.4	50.7	40.8	37.0	38.6	39.9	43.2	57.0	61.2	62.2	65.2	45.4	39.1	24.2	31.2	19.0	27.6
8th	30.2	—	41.8	47.7	49.2	43.2	44.2	41.3	40.5	41.3	39.7	40.2	42.2	45.7	49.2	50.0	50.2	47.7	45.9	45.5	44.2	42.8	43.9	42.0
9th	43.2	44.7	46.7	42.2	53.0	45.0	43.5	40.5	39.3	38.0	39.5	42.4	46.5	49.2	50.7	47.2	48.4	46.0	42.7	43.2	43.6	42.2	42.7	42.7
10th	42.6	44.7	44.9	44.9	44.4	44.3	44.3	41.2	39.0	37.7	39.7	41.4	43.7	46.7	50.3	51.1	49.5	47.8	44.4	44.4	43.7	44.2	42.2	43.6
11th	44.1	44.2	44.0	44.7	45.0	45.2	44.6	41.4	36.4	36.9	36.3	37.9	43.5	48.2	48.8	51.2	49.2	49.3	46.7	45.3	44.5	44.2	44.2	43.5
12th	43.6	44.2	44.2	44.2	44.2	44.2	43.7	43.7	42.2	39.7	37.6	38.0	41.9	45.3	48.2	48.2	48.2	47.1	45.1	44.3	44.2	44.1	44.0	43.5
13th	43.2	43.2	42.7	42.7	42.5	42.4	42.2	42.0	40.3	39.4	38.6	39.7	41.2	44.2	46.2	46.3	46.2	45.4	44.2	43.7	43.7	43.7	43.2	43.1
14th	46.8	42.9	42.9	43.3	42.8	43.1	42.6	—	38.2	37.0	36.4	37.5	41.2	44.8	47.1	47.5	46.7	46.1	44.7	44.3	44.2	43.9	43.7	43.4
15th	43.3	42.9	43.2	43.2	43.8	43.1	42.4	40.4	37.9	37.3	36.4	37.9	41.7	45.4	48.3	48.9	47.6	45.5	44.2	44.1	44.3	43.3	42.1	40.9
16th	40.9	40.3	40.5	41.2	41.2	41.2	40.8	42.2	40.2	37.2	31.7	41.2	45.0	48.7	47.8	51.4	51.3	53.2	45.1	27.7	47.2	40.5	34.9	37.7
17th	40.4	38.8	37.2	41.0	41.4	42.4	39.2	37.8	36.2	37.2	36.0	38.1	41.2	45.5	46.4	48.5	46.4	45.2	44.4	43.7	43.2	43.2	43.2	43.0
18th	43.2	44.1	44.2	43.2	43.1	42.2	43.2	41.2	39.7	35.2	38.2	40.2	43.6	46.4	48.4	49.3	48.7	46.5	44.3	43.4	43.2	43.1	42.9	42.6
19th	42.4	42.8	43.2	43.3	43.3	43.2	43.4	43.2	40.0	36.2	36.2	37.4	41.4	46.2	49.6	49.2	48.0	46.1	44.7	43.3	42.4	40.2	42.2	42.3
20th	42.2	42.2	42.3	42.9	42.3	42.2	42.7	50.2	44.7	38.4	35.7	39.7	41.8	45.8	49.2	49.4	47.2	45.2	44.3	44.2	37.2	39.2	39.2	39.2
21st	38.7	35.2	41.7	42.4	43.2	44.4	43.8	41.4	40.1	36.2	36.2	40.3	44.2	48.6	50.0	49.0	46.6	44.2	43.4	42.2	42.2	39.2	41.9	42.2
22d	43.8	42.3	42.2	43.1	43.3	43.0	42.5	39.8	37.0	34.4	35.9	39.4	43.2	45.7	47.4	46.9	45.3	44.3	43.9	43.0	42.6	—	41.2	41.2
23d	42.4	42.0	43.1	43.4	43.0	43.0	42.7	40.4	37.6	34.9	34.9	36.9	41.2	44.5	46.4	47.0	44.3	42.6	42.2	42.3	42.3	42.3	42.1	41.8
24th	40.3	42.2	42.2	42.2	42.1	41.3	40.4	38.2	36.4	34.2	35.6	37.4	40.2	42.3	45.0	45.9	45.2	43.2	42.2	42.2	42.0	41.3	41.6	41.2
25th	40.4	40.4	40.7	41.2	41.3	40.7	40.3	35.7	32.6	31.7	33.0	36.0	40.4	42.3	47.2	46.4	46.1	44.3	41.8	42.0	41.2	41.1	41.0	41.2
26th	41.3	41.2	40.9	39.6	40.3	40.0	35.2	35.7	33.4	25.7	33.2	37.6	46.7	47.0	52.1	53.0	50.5	45.6	43.3	41.7	40.6	40.4	36.2	31.7
27th	41.2	41.2	42.4	42.7	49.1	44.9	45.4	39.9	36.2	38.7	36.2	39.7	43.3	45.5	46.8	45.4	44.1	42.7	42.7	43.1	42.9	42.9	42.6	42.5
28th	42.3	42.2	41.2	42.0	41.7	41.2	40.5	37.6	35.2	34.1	34.9	37.6	42.0	45.4	47.7	50.1	48.6	45.7	44.2	43.8	43.2	43.2	42.8	42.4
29th	42.2	41.6	41.6	41.8	41.2	40.7	40.2	38.1	35.3	33.3	34.3	37.4	43.2	47.6	49.7	49.2	47.1	44.2	42.2	41.9	42.2	42.0	42.0	41.2
30th	40.3	40.2	40.2	40.2	40.0	39.7	38.7	36.2	33.8	32.9	35.7	39.8	46.1	49.4	52.4	51.4	48.6	45.1	44.3	44.2	44.2	44.2	44.2	43.9
Means	41.90	42.20	42.50	42.81	43.64	42.63	42.10	40.62	39.21	36.98	36.92	38.95	42.52	45.91	48.89	49.58	48.27	46.71	44.41	42.97	42.57	42.21	41.36	41.44
Normals	42.14	42.45	42.68	42.91	42.88	42.81	42.52	40.80	38.72	37.16	36.89	38.95	42.52	45.91	48.61	49.18	47.79	45.82	44.41	43.36	43.27	42.60	42.62	42.18

MAGNETIC DECLINATION DURING THE MONTH OF OCTOBER 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	43.7	43.2	43.4	43.7	43.4	44.2	44.0	40.0	36.6	33.3	34.4	39.4	46.2	40.9	53.8	53.3	51.4	48.0	46.2	47.0	44.9	38.7	40.5	41.2
2d	42.2	41.4	41.2	43.3	43.2	46.3	46.3	44.4	41.3	34.7	34.9	40.3	45.2	51.1	52.2	50.0	47.2	43.2	43.2	42.2	44.3	44.0	43.3	41.1
3d	42.4	43.2	44.2	45.3	44.4	43.9	43.1	39.2	35.4	35.0	34.7	38.8	45.4	51.2	54.2	54.2	52.2	47.2	45.2	45.1	46.2	38.2	44.4	34.7
4th	35.3	37.5	41.2	44.0	43.3	43.0	40.8	40.6	36.7	35.0	36.8	40.1	45.0	48.7	49.9	50.2	48.3	46.9	42.3	41.2	44.2	36.0	42.7	41.1
5th	39.0	41.0	37.5	37.2	43.3	42.1	44.7	45.2	42.6	41.1	42.2	44.5	46.3	46.7	46.2	45.8	45.2	43.4	41.9	42.8	42.0	39.7	40.0	39.7
6th	38.3	43.3	43.3	43.1	42.2	(42.0)	41.9	39.4	36.9	35.4	36.3	39.0	42.2	45.6	47.9	48.2	46.2	44.2	43.4	43.2	42.9	42.3	42.2	42.2
7th	42.1	42.0	42.1	41.9	41.2	41.0	40.2	37.7	35.2	34.1	35.1	37.7	41.9	45.8	47.5	49.2	47.1	45.2	44.0	43.5	43.2	43.2	42.5	40.6
8th	41.7	42.1	43.0	(42.8)	42.6	43.1	42.5	40.2	38.2	37.2	38.3	42.2	47.2	51.1	50.8	51.5	50.2	47.2	45.4	45.1	45.1	44.3	43.2	43.2
9th	43.2	43.2	43.2	42.8	43.0	43.0	41.6	39.2	36.5	37.3	36.0	40.0	45.2	48.3	49.3	49.3	48.7	46.7	44.2	42.4	41.7	43.0	43.6	43.7
10th	43.4	43.2	43.2	42.3	47.5	43.0	41.8	38.6	33.1	37.2	38.1	41.1	45.4	49.2	51.1	51.1	49.2	47.0	45.0	44.6	44.2	44.0	43.5	40.2
11th	43.9	43.2	44.3	46.3	44.7	43.2	41.5	38.2	38.4	35.9	37.2	40.7	46.2	50.3	51.8	51.6	48.6	45.7	44.2	44.2	44.2	43.6	44.4	44.2
12th	44.1	44.0	43.5	43.4	43.4	43.3	42.8	40.2	37.2	35.7	38.2	42.4	46.2	49.2	50.9	49.6	48.5	44.9	42.4	42.0	41.3	36.4	40.2	39.9
13th	41.0	42.2	43.2	43.2	43.2	42.7	42.9	36.2	35.0	35.1	37.2	40.9	45.3	49.3	50.2	49.9	48.1	45.8	43.3	42.8	42.3	42.3	41.3	39.3
14th	39.5	43.2	41.3	46.2	43.2	42.6	41.2	38.2	34.8	32.0	36.9	41.4	49.4	52.2	54.2	52.8	49.2	46.2	44.7	44.2	44.2	44.2	44.3	43.3
15th	43.2	43.7	43.2	43.2	42.7	42.2	41.6	35.2	35.2	32.4	37.0	40.1	48.3	54.2	55.9	54.7	50.4	46.3	43.6	43.2	44.1	42.5	42.3	42.1
16th	(42.2)	42.3	42.3	42.2	42.4	43.3	40.2	36.0	33.0	31.4	33.2	39.2	47.2	55.2	56.2	53.5	49.2	44.9	43.7	43.2	43.0	42.6	42.3	42.3
17th	42.7	43.2	43.1	42.5	41.2	41.2	38.2	34.1	32.2	31.2	33.5	39.3	45.2	51.2	54.6	53.8	51.1	45.2	43.4	43.3	42.6	43.2	41.2	40.4
18th	40.1	41.3	41.3	42.1	41.4	40.7	40.0	38.3	32.7	31.2	30.0	34.1	41.2	47.2	50.6	50.4	47.4	44.5	42.7	42.4	43.0	43.1	44.0	42.8
19th	42.4	42.3	42.4	42.3	42.4	42.0	41.7	37.5	35.5	—	—	—	—	—	—	—	—	46.3	44.9	43.8	43.8	43.5	43.1	43.1
20th	43.4	43.0	43.0	43.3	43.0	42.9	41.4	38.4	35.8	33.9	35.2	54.0	45.8	50.6	52.5	52.2	50.1	48.1	45.5	45.1	44.5	44.2	43.9	43.1
21st	43.1	43.1	43.1	44.1	43.4	43.8	42.5	41.5	38.8	37.6	38.2	41.1	43.5	49.7	52.5	51.3	50.9	48.5	46.2	45.5	45.4	45.4	44.3	45.0
22d	44.7	44.5	44.9	44.2	44.6	44.2	42.9	40.2	36.4	35.2	36.4	39.5	45.3	49.1	51.1	50.9	48.7	46.9	46.1	45.5	45.5	45.3	44.7	44.3
23d	44.2	43.8	43.4	43.1	43.3	42.9	41.8	38.3	36.7	31.7	36.2	39.9	45.0	49.3	50.9	51.1	49.5	47.4	45.5	45.4	45.4	44.1	43.8	45.5
24th	45.0	44.6	44.3	44.1	43.8	43.3	41.6	36.8	33.5	33.5	35.4	40.7	47.0	51.4	52.6	51.9	50.5	46.3	45.5	45.5	45.4	45.3	45.4	44.9
25th	(44.7)	44.5	44.3	44.3	44.9	44.2	42.6	39.9	37.5	36.6	38.6	42.7	46.0	50.6	52.2	51.9	49.3	47.1	45.4	45.1	45.1	45.3	45.3	45.3
26th	45.3	44.9	44.9	45.1	44.7	45.5	44.1	41.6	33.8	35.9	37.3	44.7	51.7	54.3	56.2	54.4	51.0	47.4	45.5	44.2	44.2	45.1	45.1	44.3
27th	44.1	43.1	44.2	44.9	44.2	43.9	42.6	38.8	35.2	34.7	37.4	41.6	48.1	53.2	54.9	53.8	50.2	47.8	45.7	45.5	44.2	44.2	42.9	36.2
28th	40.2	42.7	42.2	43.1	42.9	44.3	46.3	38.8	37.4	32.4	36.6	42.9	46.9	48.9	51.8	52.6	51.8	49.5	47.3	44.6	42.9	43.9	41.5	42.9
29th	42.9	44.1	44.3	44.1	45.5	43.8	41.6	38.8	36.0	33.5	35.1	39.0	44.2	49.5	50.9	50.9	49.0	47.0	45.5	45.0	44.6	43.7	41.5	42.5
30th	40.2	40.2	41.2	39.0	37.5	37.5	36.8	41.5	34.6	35.4	37.8	40.6	45.4	45.4	52.2	52.1	49.5	47.1	45.5	44.5	43.6	40.4	39.9	39.8
31st	40.3	43.6	39.8	40.2	41.5	42.9	42.6	40.4	33.2	35.0	34.6	38.6	43.8	49.0	52.8	51.9	51.8	44.9	46.9	44.2	40.6	43.9	42.7	42.7
Means	42.21	42.83	42.79	43.14	43.16	42.97	42.06	39.14	36.46	34.72	36.29	40.83	45.72	49.61	51.93	51.47	49.35	46.35	44.65	44.17	43.81	42.76	42.84	41.99
Normals	42.44	43.00	42.94	43.34	43.35	43.15	42.23	38.92	36.09	34.50	36.31	41.12	45.33	49.38	51.83	51.67	49.35	46.35	44.65	44.17	43.81	43.57	42.84	42.41

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF NOVEMBER 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	31.0	30.8	31.9	33.1	33.1	32.3	32.3	30.0	27.7	25.1	25.2	27.5	31.7	35.3	38.1	37.5	37.0	35.5	34.1	33.0	32.6	32.1	32.9	31.9
2d	32.5	32.1	32.5	32.4	35.0	35.0	36.2	31.0	27.8	24.7	24.2	26.1	30.0	35.0	37.4	37.5	36.2	33.3	32.0	30.5	30.0	30.0	28.4	25.5
3d	21.9	26.9	26.0	27.3	27.0	34.5	33.0	29.1	27.7	25.6	26.5	28.0	32.3	34.2	35.8	—	36.0	34.0	32.4	31.2	32.0	31.7	31.5	31.6
4th	31.9	32.0	32.0	32.0	32.5	32.1	30.8	29.2	27.8	26.9	27.7	29.7	32.0	34.7	37.1	36.7	36.0	34.5	33.3	32.0	32.8	32.6	32.2	32.0
5th	32.0	31.9	31.7	31.7	31.8	31.2	30.0	27.0	27.0	24.4	25.0	28.0	32.2	34.3	27.1	37.6	36.2	34.5	33.0	33.0	32.5	31.1	31.0	30.9
6th	32.0	32.6	31.7	32.2	32.9	32.1	30.1	28.4	28.1	26.1	26.5	28.5	31.7	35.8	37.3	39.0	38.0	36.3	35.0	32.8	30.9	31.4	31.9	32.0
7th	32.6	33.1	33.7	32.5	32.5	32.0	30.9	29.0	26.0	24.5	25.4	28.1	34.7	39.8	43.0	41.4	39.2	36.0	34.1	33.5	32.9	32.9	32.8	32.6
8th	32.7	33.4	32.1	32.5	32.7	32.1	34.0	32.8	30.7	26.4	22.6	29.0	31.2	36.5	38.3	37.5	35.9	33.9	32.5	33.0	31.7	32.0	32.0	32.0
9th	32.0	32.0	32.0	32.0	32.0	31.2	30.0	28.3	27.0	25.9	26.0	28.3	32.0	34.8	36.1	36.0	35.4	34.0	32.5	31.4	30.9	27.0	29.8	29.0
10th	29.3	28.6	30.0	31.0	31.0	30.1	28.3	26.4	25.8	25.0	26.0	29.1	32.0	34.3	—	34.6	32.6	31.7	31.1	30.9	30.9	31.2	31.5	31.4
11th	31.0	31.0	31.2	31.4	32.0	30.4	28.7	25.0	24.0	24.5	26.8	31.4	35.0	37.0	37.9	36.8	35.0	33.2	31.3	31.0	31.3	31.5	32.0	31.7
12th	31.2	31.5	32.0	32.0	35.0	—	—	28.0	27.0	27.2	29.1	32.8	38.6	41.9	42.3	40.8	36.9	34.0	32.8	32.2	32.0	31.8	31.8	31.6
13th	31.8	31.7	32.0	31.9	32.0	31.6	30.0	27.9	24.1	24.9	28.7	34.1	39.2	42.0	41.8	39.0	36.6	34.0	32.9	32.5	32.5	32.6	32.8	32.7
14th	32.3	32.0	32.2	32.3	32.0	31.5	30.8	28.5	26.0	24.1	25.2	28.9	33.0	37.1	39.7	39.0	37.0	34.2	32.9	32.3	32.5	32.6	32.6	32.0
15th	32.3	32.2	32.1	31.7	32.4	32.0	30.1	28.0	25.4	25.0	25.8	27.0	31.9	35.6	37.8	38.0	37.0	35.7	34.5	33.4	33.3	32.3	32.0	29.4
16th	30.0	30.3	31.9	31.7	30.8	29.6	28.0	25.0	23.6	24.8	25.2	27.9	31.2	34.1	38.1	38.9	39.0	37.0	35.0	33.0	32.4	32.1	31.1	30.5
17th	30.0	29.2	27.7	31.0	30.4	29.0	28.2	—	26.0	25.7	27.3	30.1	32.4	33.9	35.6	36.2	—	35.3	33.8	32.3	31.9	31.1	31.2	31.4
18th	31.2	30.5	31.8	31.8	31.9	33.2	30.9	27.5	24.3	23.8	24.8	27.0	32.0	35.0	36.0	36.0	33.8	32.0	—	31.8	31.8	32.1	31.7	31.8
19th	29.0	31.2	32.0	31.7	31.5	31.0	30.2	28.6	—	27.8	29.2	31.6	32.5	34.7	35.8	36.0	35.0	34.2	33.8	33.3	33.0	33.0	32.5	33.0
20th	31.9	31.0	31.7	31.7	32.0	31.1	30.6	27.9	26.2	25.8	26.3	29.3	30.9	34.0	36.1	37.9	36.0	34.5	33.8	32.6	32.4	32.7	32.2	32.4
21st	32.1	32.0	32.4	32.7	32.2	31.9	29.6	28.2	26.5	25.4	27.2	30.7	32.9	36.0	37.0	37.0	35.8	33.8	32.4	31.6	32.0	32.0	31.8	31.9
22d	32.0	32.0	32.1	32.2	27.5	31.8	30.0	26.9	25.5	26.1	28.8	31.9	34.8	37.5	38.4	36.6	34.3	32.5	31.9	31.3	31.0	31.0	30.8	29.6
23d	29.7	30.0	30.0	30.8	30.5	29.2	28.0	26.7	24.5	23.8	25.8	28.9	32.1	35.7	37.0	38.2	35.5	35.0	34.8	—	—	—	—	—
24th	—	—	—	—	—	—	29.0	27.1	27.5	25.1	29.3	33.1	36.0	38.7	39.5	38.1	36.1	34.2	33.1	32.3	33.3	33.0	31.6	32.5
25th	32.7	32.7	32.0	32.0	33.0	31.2	30.0	28.6	28.8	28.5	31.0	33.1	35.0	37.9	39.7	39.1	37.6	35.4	34.0	33.5	33.0	32.8	32.0	30.5
26th	30.0	33.1	31.2	32.0	33.6	32.1	31.6	—	27.0	27.7	28.7	30.0	33.0	35.9	38.5	38.4	37.8	36.2	34.7	34.0	33.3	33.8	32.0	30.7
27th	28.1	30.2	32.0	32.0	32.0	31.3	30.8	29.0	27.0	25.7	27.1	28.7	33.7	32.1	39.8	40.5	39.0	37.5	34.0	33.9	33.5	32.8	32.5	31.8
28th	31.9	30.0	32.0	33.6	33.7	34.6	30.9	27.3	—	25.5	27.2	31.9	36.6	41.0	42.8	41.9	39.0	36.1	33.2	33.0	33.5	32.8	31.9	30.3
29th	32.0	33.0	32.5	32.5	32.5	32.5	30.9	29.3	27.5	28.1	30.6	34.0	38.3	41.6	43.0	41.0	38.0	35.2	33.5	33.1	32.7	33.7	32.6	30.4
30th	30.7	31.8	31.4	32.9	33.0	32.0	30.8	27.8	26.2	27.0	31.0	35.1	38.9	40.8	40.9	39.2	36.1	34.5	32.9	31.4	31.7	31.0	29.6	30.0
Means	30.96	31.34	31.51	31.88	32.02	31.74	30.51	28.16	26.53	25.70	26.67	30.03	33.59	36.57	38.23	38.15	36.48	34.61	33.29	32.41	32.22	31.96	31.68	29.14
Normals	31.28	31.50	31.86	32.05	32.37	31.74	30.17	27.99	26.37	25.70	26.35	29.20	32.76	35.57	37.29	38.14	36.62	34.61	33.29	32.41	32.22	32.13	31.68	31.12

MAGNETIC DECLINATION DURING THE MONTH OF DECEMBER 1860.

Value of a part of division = 0.802 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	30.0	30.6	32.0	33.2	33.6	32.8	30.0	—	—	27.5	29.0	32.0	34.2	36.6	39.0	38.0	36.2	34.6	33.2	33.0	32.9	29.8	31.0	31.8
2d	32.7	32.8	33.0	32.5	32.0	31.5	29.7	27.0	24.1	24.8	26.6	31.0	34.4	38.2	39.0	38.4	36.8	35.0	—	32.6	32.2	31.8	32.0	30.0
3d	32.2	32.5	32.5	33.0	32.0	31.1	29.6	27.5	26.2	24.3	27.7	33.4	37.7	40.7	41.8	40.6	38.6	37.0	—	34.0	33.4	33.7	33.5	33.5
4th	33.7	34.0	34.0	35.6	34.0	33.8	32.3	30.5	27.3	26.8	29.0	32.9	35.1	38.1	39.3	39.5	37.8	36.1	34.2	33.9	33.8	33.6	33.6	33.2
5th	33.3	33.2	33.4	33.1	33.3	32.7	30.0	27.4	25.4	26.3	29.7	33.6	36.9	39.0	40.0	39.3	37.6	36.0	34.0	33.0	33.3	32.6	33.0	—
6th	33.6	33.7	33.9	34.5	34.3	32.8	30.8	27.3	24.2	25.0	27.6	30.4	31.9	34.3	36.4	37.0	36.5	35.3	33.7	33.4	33.6	33.7	33.6	33.1
7th	32.9	33.0	32.9	32.8	32.7	31.7	30.3	28.5	26.9	26.8	28.0	30.0	31.1	33.0	35.2	35.0	34.7	33.5	32.0	31.3	31.6	32.0	31.8	31.5
8th	31.2	31.1	31.2	31.8	31.8	31.0	29.3	28.8	27.6	28.6	30.4	31.9	33.6	35.0	36.1	35.4	34.4	33.5	32.8	32.9	33.2	33.2	33.2	33.1
9th	33.1	33.1	33.3	33.2	33.0	31.5	29.0	26.9	—	30.0	31.3	33.8	35.7	37.5	39.2	38.3	36.9	34.5	34.0	34.0	35.0	35.7	35.0	34.6
10th	33.3	31.0	33.0	36.0	33.1	30.6	29.0	28.0	—	29.2	31.0	34.0	36.4	37.8	39.0	40.0	37.9	37.3	34.7	34.0	36.0	36.4	35.9	31.0
11th	—	—	—	—	—	28.5	28.2	26.7	28.0	29.2	31.8	39.3	42.0	44.1	44.2	41.2	39.0	34.7	35.8	33.5	32.9	32.2	28.0	33.5
12th	29.8	30.7	34.5	33.0	32.4	30.5	28.7	27.1	27.0	29.7	32.9	34.7	37.2	38.2	39.0	39.0	37.6	35.0	34.0	34.0	34.3	34.5	34.4	34.3
13th	34.1	34.2	34.2	34.0	33.5	32.8	31.1	30.0	29.0	29.0	31.0	33.1	34.7	35.0	36.5	36.0	33.8	32.7	31.5	31.0	32.0	32.9	33.0	33.2
14th	33.4	33.6	33.5	33.4	33.8	33.0	31.2	29.1	26.3	26.0	28.3	31.5	36.3	40.7	43.0	41.0	38.9	36.5	34.9	34.5	33.9	34.0	34.1	33.7
15th	34.0	34.0	34.0	34.0	34.0	33.7	32.3	30.5	29.0	28.6	29.0	32.8	35.0	37.7	40.1	41.0	39.2	37.0	34.3	33.7	33.9	33.7	33.8	33.6
16th	33.5	33.3	33.7	33.9	33.9	33.0	31.5	29.7	24.2	15.0	19.0	29.7	33.3	39.9	42.1	42.7	39.1	36.7	34.2	35.0	32.5	32.0	31.2	31.4
17th	33.2	33.9	34.0	31.6	33.0	34.0	34.0	33.8	30.6	30.0	30.0	31.2	33.3	35.0	36.8	36.0	35.0	34.0	33.4	34.4	34.0	32.5	32.1	32.7
18th	32.1	31.3	32.0	32.5	32.5	30.9	30.2	29.1	27.6	26.6	26.9	27.3	29.1	30.7	32.6	33.1	32.0	31.3	32.0	29.5	30.4	30.9	30.4	29.5
19th	28.6	29.7	30.7	30.9	31.0	30.4	30.0	29.3	26.5	26.0	26.5	27.3	28.2	30.9	32.2	33.2	33.9	34.0	34.0	33.2	32.8	32.5	32.0	32.0
20th	31.4	31.5	31.0	30.0	30.5	29.3	29.7	28.2	27.2	27.6	26.5	29.9	33.2	36.0	38.4	38.4	37.0	36.7	36.0	34.2	30.0	32.3	33.3	32.8
21st	31.9	32.4	32.6	33.0	35.0	32.5	31.0	31.7	29.3	27.8	28.4	29.9	31.7	34.8	38.4	39.8	38.8	37.6	36.2	34.5	34.0	33.6	32.5	31.2
22d	30.7	29.9	31.5	32.0	31.9	33.0	32.7	29.0	28.9	28.0	28.6	29.1	31.1	33.2	35.7	37.1	37.1	37.0	36.1	30.4	34.3	34.0	32.1	29.7
23d	32.0	31.0	32.6	31.6	31.6	31.4	32.0	29.0	28.4	27.3	28.7	29.4	31.2	34.0	36.1	36.7	36.8	35.4	35.1	34.0	32.0	32.9	32.5	32.0
24th	32.1	31.3	31.3	30.8	—	31.8	30.2	28.6	27.2	27.3	28.0	29.0	32.6	35.0	36.0	36.0	36.0	35.2	34.4	33.6	33.0	33.5	33.1	33.0
25th	32.0	32.0	31.9	32.0	31.5	31.2	30.9	28.2	26.7	27.0	28.9	31.0	33.8	36.2	36.6	36.8	34.8	32.6	31.9	30.1	29.2	29.9	30.2	31.6
26th	31.8	32.0	31.1	30.6	32.8	29.9	28.6	25.2	26.2	23.1	22.5	25.3	27.9	31.0	33.2	33.0	33.1	31.8	31.6	29.1	29.8	29.8	30.0	31.0
27th	29.5	29.6	31.0	31.0	—	32.5	30.0	26.1	23.6	21.7	25.6	26.8	29.2	33.6	33.1	33.8	32.5	30.0	30.2	30.4	30.6	30.4	28.2	28.5
28th	29.7	30.0	30.5	31.6	30.5	29.0	27.6	24.2	21.1	21.5	22.0	25.2	28.0	30.7	32.5	32.5	30.9	30.0	29.3	29.1	29.4	29.5	30.0	30.5
29th	30.0	30.2	30.2	30.3	30.0	29.2	27.6	24.8	22.1	21.9	24.0	27.1	37.5	39.1	39.3	38.0	35.4	33.4	32.3	32.5	32.4	32.8	33.0	32.6
30th	32.6	32.9	32.3	32.3	31.6	31.0	29.3	26.1	24.0	24.5	27.8	31.2	34.5	39.5	40.7	40.0	39.1	36.4	35.0	34.0	34.2	34.1	34.1	33.9
31	33.8	33.4	33.0	33.2	—	32.0	30.0	26.8	24.7	25.0	28.9	33.0	37.6	40.3	41.0	40.4	38.0	36.7	36.1	34.7	34.4	34.0	33.9	33.4
Means	32.07	32.06	32.49	32.58	32.57	31.58	30.22	28.17	26.40	26.20	27.92	30.87	33.69	36.32	37.79	37.65	36.95	34.76	33.69	32.82	32.74	32.73	32.37	32.20
Normals	32.19	32.06	32.49	32.44	32.57	31.58	30.09	28.10	26.62	26.92	28.42	31.47	33.65	36.19	38.08	38.24	38.42	35.35	33.79	33.21	32.98	32.60	32.55	32.32

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF JANUARY 1882.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	33.5	33.2	—	—	—	34.1	30.0	—	25.0	24.5	27.6	31.9	35.5	35.7	40.5	40.1	39.0	37.3	35.7	34.9	34.7	34.5	—	34.0
2d	33.0	32.0	33.9	34.0	33.8	32.0	30.0	26.5	25.9	25.4	28.5	32.8	37.0	39.0	40.0	39.7	38.3	37.3	36.5	35.5	35.0	34.5	34.0	33.8
3d	34.0	34.3	34.1	33.9	34.1	32.5	31.5	26.9	24.5	27.3	31.0	34.6	37.3	40.0	39.7	38.1	37.3	36.0	35.0	34.7	34.4	34.4	34.2	34.0
4th	—	33.7	—	32.0	—	32.0	30.0	27.4	26.1	27.1	29.6	32.8	35.1	37.0	37.2	37.1	37.7	36.9	36.2	35.5	35.8	34.8	34.2	33.0
5th	34.3	32.5	—	33.0	32.8	31.6	30.0	26.0	25.7	26.4	29.1	32.0	35.0	37.0	38.5	38.9	38.2	37.2	36.1	35.0	35.0	—	34.7	34.1
6th	33.6	33.4	33.3	33.1	33.2	32.9	31.3	29.4	27.3	26.7	28.4	31.1	33.3	36.6	37.6	38.0	38.2	38.9	38.2	36.5	35.5	33.8	34.1	33.4
7th	32.1	32.0	31.4	34.1	30.9	27.0	29.4	27.0	26.7	29.0	31.5	34.8	36.8	37.7	37.6	36.1	36.1	36.7	37.0	35.2	34.5	33.6	33.6	33.5
8th	—	34.0	33.4	33.0	32.7	32.1	30.2	28.1	26.0	26.8	31.0	36.0	38.0	38.9	37.6	36.8	35.9	35.1	34.4	34.7	34.6	33.3	34.4	33.7
9th	33.0	33.1	33.3	32.9	—	32.2	29.0	26.7	26.3	28.6	33.1	37.6	40.4	41.9	40.5	38.5	37.3	36.0	33.2	35.2	35.0	34.8	34.4	34.6
10th	34.3	33.1	33.1	32.4	31.7	31.2	30.0	27.0	24.5	26.4	32.1	37.2	39.9	40.4	40.0	37.8	36.2	35.8	35.1	34.5	34.0	34.0	34.0	33.5
11th	33.6	33.3	—	33.1	32.6	31.7	29.6	27.2	23.9	24.2	28.2	34.1	38.6	42.0	41.6	40.2	37.8	35.2	33.3	33.3	34.5	34.6	34.9	34.4
12th	—	33.6	33.4	32.9	32.0	31.2	29.2	25.5	24.5	25.8	29.0	34.2	38.8	42.6	44.0	42.2	39.1	36.1	34.8	34.8	34.2	32.2	33.8	34.0
13th	—	33.2	33.5	32.6	—	32.6	32.4	27.9	23.8	21.8	30.0	36.6	41.1	44.9	44.5	41.2	38.1	34.8	33.8	34.2	33.8	34.5	33.8	33.0
14th	29.6	32.1	33.0	33.9	32.1	31.1	30.0	27.2	25.5	26.1	28.8	32.0	35.0	39.1	41.0	40.3	37.9	36.2	35.1	33.5	33.3	33.2	34.1	34.1
15th	34.8	33.7	33.0	34.2	33.9	34.1	31.6	30.0	25.7	24.1	25.9	29.1	34.0	38.2	40.7	39.3	37.7	36.1	35.3	34.8	33.4	32.1	33.5	34.0
16th	33.5	33.5	32.9	33.7	33.0	32.0	30.4	28.2	24.5	23.8	24.7	28.7	32.6	36.0	40.0	40.3	38.7	36.3	34.5	34.0	34.1	34.4	34.3	34.1
17th	33.8	33.7	33.7	33.8	33.7	33.5	32.5	28.4	27.0	27.0	29.5	33.0	35.9	37.6	38.5	38.6	38.4	36.5	35.5	34.3	35.0	34.9	34.5	34.2
18th	33.9	33.8	33.5	33.9	34.2	32.6	31.0	29.4	27.5	26.6	27.9	30.5	33.6	35.9	38.7	39.2	38.1	36.5	35.2	34.9	35.0	34.5	34.5	33.9
19th	33.6	33.7	32.9	32.2	32.7	33.3	31.7	30.2	28.5	29.2	32.4	35.3	37.0	39.9	41.1	40.0	38.1	36.5	35.7	34.8	35.0	34.6	34.0	32.9
20th	33.0	32.9	32.5	32.6	32.2	32.2	31.4	30.3	29.8	28.1	29.5	30.5	33.1	37.0	39.0	39.2	38.2	37.1	36.0	35.0	34.7	34.6	33.6	33.0
21st	29.8	32.3	31.0	30.2	31.1	30.8	30.0	30.1	25.0	29.3	29.6	33.4	34.8	37.6	39.3	39.7	38.6	37.2	33.3	34.0	35.0	34.1	33.0	31.0
22d	32.5	3.0	33.9	32.8	32.6	31.9	31.6	31.2	29.1	27.5	28.3	31.0	32.9	36.0	39.9	41.3	39.9	37.9	36.2	33.6	35.0	34.3	34.5	34.0
23d	33.1	32.9	31.7	31.1	39.4	32.5	32.1	26.2	27.0	26.2	28.3	32.0	33.9	35.9	38.3	39.0	37.8	36.6	39.1	33.6	27.5	27.7	29.0	26.5
24th	30.8	31.0	29.2	32.6	32.0	31.8	29.5	29.7	29.2	31.2	30.1	32.7	36.2	38.8	39.4	38.3	38.0	36.5	34.6	34.0	24.0	28.7	20.2	28.4
25th	—	—	—	—	—	—	31.7	30.0	28.5	26.4	28.9	32.0	35.0	35.0	38.6	39.4	38.0	36.5	34.6	34.0	24.0	28.7	20.2	28.4
26th	34.2	25.6	29.5	23.1	33.7	27.0	30.0	30.8	29.0	30.0	31.1	34.3	38.0	39.0	39.0	38.9	37.7	32.9	35.1	31.8	35.3	34.0	27.7	33.0
27th	21.8	28.7	29.6	29.7	29.9	34.1	29.9	25.6	26.0	30.2	25.8	26.9	34.0	36.3	39.9	41.2	42.0	41.4	36.0	27.1	30.9	25.8	30.4	29.5
28th	28.7	32.9	34.3	—	34.0	31.1	34.7	29.9	27.6	27.2	27.4	29.8	33.2	36.2	39.3	40.0	39.0	37.0	34.8	33.3	33.7	33.9	33.0	32.2
29th	32.7	32.8	33.1	33.5	33.8	32.5	31.2	28.8	25.1	23.4	24.5	28.8	34.0	38.0	41.4	41.8	40.2	38.6	35.7	34.0	33.9	33.7	33.5	33.0
30th	33.7	33.6	34.3	35.0	34.4	35.1	32.3	31.8	32.5	28.6	24.5	27.6	32.9	37.8	41.4	41.9	41.0	39.0	36.0	34.7	35.4	32.5	32.2	30.0
31st	33.1	33.0	33.0	32.9	33.1	32.0	31.1	28.3	25.8	23.6	23.1	26.4	29.8	34.4	38.2	39.9	38.9	37.0	35.0	34.9	34.3	34.1	33.8	33.5
Means	32.46	32.69	32.71	32.58	33.06	32.02	30.82	28.39	26.57	26.73	28.69	32.25	35.57	38.24	39.78	39.45	38.30	36.54	35.04	33.96	33.86	33.22	32.77	32.79
Normals	33.37	33.08	32.99	32.93	32.81	32.28	30.69	28.27	26.25	26.49	28.96	32.61	34.96	37.68	39.47	39.56	38.18	36.80	35.24	34.46	34.55	33.87	33.77	33.29

MAGNETIC DECLINATION DURING THE MONTH OF FEBRUARY 1881.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	33.1	32.0	34.0	—	33.5	33.0	29.0	31.0	30.2	26.9	29.4	32.0	37.4	39.2	41.3	40.7	39.2	—	35.0	33.7	31.1	33.3	33.0	32.0
2d	31.4	29.3	30.6	31.2	32.0	30.8	30.1	28.3	26.7	26.6	26.7	29.6	32.0	34.2	36.9	37.7	37.2	35.8	34.3	33.0	32.8	32.0	30.9	32.0
3d	31.5	30.9	31.5	30.3	33.9	30.7	29.8	29.0	27.8	27.4	29.2	32.0	35.6	36.6	38.1	38.6	37.6	35.1	33.5	33.1	30.7	31.8	32.0	31.5
4th	31.4	31.0	30.8	30.0	30.4	29.9	29.2	27.9	27.0	27.0	29.0	32.6	35.0	36.8	38.0	37.6	36.5	35.5	34.1	33.0	32.6	32.9	32.6	31.6
5th	31.5	31.5	31.5	31.5	—	32.0	29.9	28.4	27.1	27.6	29.6	34.3	37.7	39.3	39.8	38.7	37.0	34.0	31.8	31.3	32.2	31.5	31.8	31.5
6th	31.1	31.1	31.3	31.7	—	—	29.3	27.0	27.0	26.9	30.8	35.3	37.9	38.8	39.6	39.0	37.1	36.0	35.0	34.5	35.0	34.9	33.5	34.1
7th	33.9	33.2	32.9	33.0	32.8	32.4	31.5	29.9	29.2	28.1	31.2	35.0	37.4	39.5	42.0	41.5	39.7	37.2	35.1	34.2	34.5	32.6	34.8	34.1
8th	33.8	33.3	32.6	32.6	33.3	33.0	32.6	30.3	29.1	28.1	29.6	32.1	36.0	39.1	40.0	40.0	39.2	36.4	34.8	34.1	34.2	34.6	34.3	34.1
9th	34.0	33.5	32.1	32.2	32.5	32.8	32.8	30.0	29.0	27.6	28.3	30.9	35.2	37.9	40.1	40.7	40.2	38.8	37.0	34.9	—	—	—	32.0
10th	33.3	32.4	32.9	32.9	32.9	32.6	32.1	30.0	28.4	26.8	28.7	33.1	38.1	41.6	44.0	43.1	41.5	39.0	35.2	35.0	34.9	33.1	32.0	28.0
11th	31.9	33.3	33.0	32.8	33.7	33.1	30.5	27.7	28.8	27.2	28.2	30.2	36.1	40.3	42.0	40.8	39.1	37.5	35.0	33.0	31.4	29.6	23.0	28.0
12th	32.7	35.0	33.8	33.2	33.8	33.1	32.7	31.1	31.0	28.3	28.0	31.0	34.6	37.6	40.3	41.0	39.0	36.9	34.2	33.0	30.0	32.9	33.5	33.0
13th	33.0	30.9	30.8	30.2	36.0	33.2	33.2	—	33.4	30.5	27.7	31.7	35.9	39.0	40.7	41.0	39.0	36.7	32.0	33.8	34.0	33.9	33.7	33.1
14th	33.7	33.7	33.6	33.6	33.5	33.1	32.5	30.9	29.1	27.4	27.3	30.0	32.9	36.4	40.0	40.5	38.7	36.6	34.4	33.8	33.2	33.8	33.9	33.6
15th	33.5	33.2	33.2	33.8	33.5	33.0	32.1	30.0	27.3	27.4	28.1	30.8	34.2	38.2	42.0	43.0	41.0	37.9	35.9	34.5	34.1	33.4	32.8	32.5
16th	32.8	32.9	32.7	33.0	32.9	32.9	33.6	31.4	28.9	27.0	26.9	29.0	33.0	36.8	39.4	39.7	38.4	37.6	36.3	34.5	34.1	34.7	33.4	27.8
17th	29.8	31.0	30.0	31.0	30.8	30.4	30.5	27.0	28.3	27.6	28.9	31.9	35.6	38.5	40.3	40.8	38.9	37.5	36.0	34.0	33.0	27.5	30.1	31.0
18th	30.8	31.6	31.5	31.5	31.6	31.8	30.5	28.8	27.3	26.8	28.0	31.0	34.8	37.8	41.0	41.4	40.0	37.8	35.2	33.5	33.3	33.0	32.1	32.0
19th	31.5	31.2	30.8	29.9	30.8	30.4	30.8	29.1	28.3	28.0	28.4	31.3	34.7	38.2	40.1	41.1	40.1	38.1	36.1	34.8	34.2	34.8	33.0	30.1
20th	32.0	31.6	32.5	33.1	33.0	32.6	31.4	29.0	27.3	27.0	27.3	29.0	32.0	35.5	38.0	39.2	39.1	37.8	36.3	34.5	34.0	33.6	33.9	33.0
21st	33.0	33.0	33.0	33.0	33.0	32.5	31.4	29.3	28.1	27.8	29.4	32.1	35.8	38.1	40.1	41.0	40.4	38.0	37.0	35.6	34.9	34.8	34.1	33.7
22d	33.0	32.0	32.0	29.9	30.5	29.6	33.5	30.7	25.0	31.0	30.7	34.1	35.5	36.8	38.6	39.1	38.7	37.2	35.7	35.5	34.5	34.0	30.0	34.5
23d	32.2	32.9	32.8	33.0	33.0	34.3	33.1	31.7	29.2	29.0	29.5	32.5	34.6	37.5	38.3	39.1	38.6	36.3	33.1	34.0	34.1	34.0	33.9	33.7
24th	33.7	33.5	33.2	33.2	32.9	32.6	31.3	29.0	28.1	27.6	30.2	33.4	36.0	36.1	38.1	38.6	37.0	35.9	35.0	35.0	34.6	34.8	34.4	34.0
25th	32.7	33.5	32.4	32.1	31.7	30.5	29.0	27.8	27.3	28.0	29.4	32.9	35.8	37.8	39.3	40.0	38.6	36.5	35.0	34.9	34.4	32.8	33.6	33.4
26th	32.1	32.4	32.8	32.6	—	—	31.0	29.0	28.8	28.5	29.7	32.4	33.8	34.0	35.0	35.5	35.0	35.0	35.2	34.5	32.0	33.8	34.0	33.8
27th	33.3	33.0	33.2	32.8	32.9	32.0	30.3	28.3	26.0	26.6	29.3	32.0	34.3	35.8	37.7	37.7	36.9	35.8	34.5	34.1	34.2	33.7	29.6	28.0
28th	29.7	28.7	27.9	28.7	25.7	39.1	28.3	32.8	35.1	30.6	36.5	36.1	34.0	36.6	38.4	37.2	33.1	36.1	34.9	30.1	31.0	29.1	29.0	27.5
Means	32.37	32.13	32.12	31.96	32.42	32.36	31.14	29.46	28.53	27.83	29.14	32.08	35.21	37.64	39.61	39.80	38.17	36.85	34.92	33.93	33.30	33.00	32.30	31.92
Normals	32.37	32.26	32.28	31.96	32.56	32.09	31.14	29.46	28.21	27.83	28.87	31.80	35.21	37.77	39.62	39.96	38.80	36.85	34.92	34.07	33.30	33.53	32.84	32.80

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF MARCH 1861.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	33.0	27.0	32.8	27.8	32.6	26.9	28.4	29.9	26.8	24.7	28.7	33.1	35.0	37.7	40.8	41.0	40.0	38.0	32.3	33.2	29.9	30.9	30.8	26.5
2d	25.0	30.0	29.0	23.8	29.4	30.3	30.8	—	24.2	25.7	27.6	30.7	33.0	34.4	36.6	35.6	38.2	35.6	34.5	33.4	32.3	31.8	32.0	31.2
3d	33.0	29.7	29.3	31.0	32.6	30.8	29.0	26.0	26.4	28.0	29.6	33.2	37.0	39.7	40.7	40.0	38.7	36.1	34.5	33.2	33.2	33.1	31.9	32.9
4th	32.6	31.8	33.3	33.6	33.0	33.0	32.0	27.7	24.7	24.0	26.8	31.4	37.9	41.7	43.1	42.4	40.5	36.6	33.9	33.0	33.3	33.3	33.1	33.0
5th	33.0	33.0	33.5	35.0	34.2	34.0	32.5	29.3	26.2	24.4	27.1	32.6	36.9	40.8	43.3	42.5	39.4	37.2	35.8	35.0	35.0	34.3	33.6	33.1
6th	33.0	33.1	34.0	33.2	—	—	33.0	29.9	27.2	25.3	26.0	29.6	34.7	39.0	42.1	42.5	40.9	37.2	35.0	35.1	35.0	34.0	32.0	32.1
7th	32.9	32.1	32.8	33.0	33.0	32.9	32.0	29.6	27.7	26.4	20.3	26.8	32.3	36.5	39.4	40.3	39.2	36.7	35.1	34.9	34.9	34.4	33.7	32.5
8th	33.2	33.5	33.1	33.0	33.0	32.4	31.9	30.8	29.0	27.3	26.1	27.6	31.8	36.0	39.9	42.0	40.2	37.7	35.3	34.8	34.3	34.1	34.0	33.8
9th	33.5	33.4	33.3	33.1	33.0	32.8	32.3	30.1	28.0	26.9	28.3	30.7	35.3	38.9	40.3	40.0	38.5	36.5	35.7	36.1	35.7	35.5	32.8	31.7
10th	32.1	32.9	30.9	27.1	24.9	27.6	28.9	32.1	31.8	32.3	32.0	32.7	36.2	40.7	42.0	39.0	35.1	33.7	33.4	33.8	34.0	31.9	32.2	32.0
11th	31.6	33.4	33.8	33.9	33.1	37.7	33.9	30.0	27.9	25.9	29.8	30.7	35.5	39.7	41.2	39.8	37.6	35.2	34.0	34.1	33.7	33.4	33.8	33.8
12th	34.0	34.8	34.1	34.0	33.6	33.1	31.1	29.0	26.0	26.1	23.9	32.5	39.6	42.9	43.3	43.5	39.5	38.1	35.4	35.0	34.2	33.7	33.5	33.1
13th	32.1	—	33.9	33.7	33.4	33.0	32.0	29.2	27.6	26.4	28.6	32.3	36.6	39.9	41.3	40.8	38.1	35.7	33.8	33.9	33.8	33.6	33.2	33.1
14th	33.1	33.1	33.1	33.3	33.9	35.0	35.1	30.6	29.3	27.7	30.2	33.5	38.5	41.8	42.1	41.0	39.2	36.1	36.2	37.2	24.8	31.0	32.7	33.0
15th	31.4	30.3	32.0	32.1	32.8	32.6	29.9	31.0	23.2	28.5	29.8	32.1	35.1	37.9	39.7	40.0	38.5	36.3	35.0	34.9	34.3	33.6	33.7	32.6
16th	32.8	33.4	32.9	33.0	32.8	32.8	32.8	31.2	28.6	26.5	27.3	29.4	34.3	39.2	40.8	42.2	41.0	—	34.5	34.7	34.0	33.7	31.8	33.5
17th	33.2	33.5	33.6	33.8	33.6	33.0	32.5	30.0	27.7	26.9	23.7	32.4	36.2	39.2	40.3	40.7	38.6	36.0	35.0	34.6	34.1	33.9	33.7	32.0
18th	33.1	32.8	32.9	33.0	32.4	33.7	34.2	32.3	30.6	27.8	29.0	32.2	35.7	39.0	40.5	40.2	38.7	36.6	35.2	34.9	34.3	34.1	34.0	29.5
19th	33.0	31.0	32.0	31.8	33.0	33.1	32.7	30.2	23.8	27.3	29.0	31.4	35.2	38.1	39.1	39.2	38.0	35.1	33.5	32.9	33.0	32.8	29.2	29.1
20th	28.9	28.9	24.8	27.6	29.1	32.3	35.7	29.2	27.8	26.0	25.1	29.0	33.1	37.0	39.9	40.1	37.2	34.4	32.3	31.5	31.1	28.6	28.0	27.9
21st	25.0	28.1	30.1	30.0	30.2	30.9	29.9	27.3	26.2	26.0	23.0	31.3	33.8	36.2	38.1	38.8	37.2	35.0	32.9	31.0	28.9	30.0	29.9	29.0
22d	29.2	29.1	28.8	29.2	30.1	29.1	30.1	27.1	26.8	27.8	28.6	31.1	34.7	37.2	38.8	39.0	38.3	35.0	33.7	33.4	33.0	32.1	31.5	31.5
23d	31.1	31.0	30.5	31.0	30.4	30.1	29.6	27.7	26.2	26.0	29.3	31.7	35.6	39.2	39.7	38.2	35.9	34.0	32.0	33.2	32.7	32.2	31.5	31.9
24th	31.6	29.1	27.4	26.2	25.7	27.0	28.8	27.3	26.7	27.2	30.1	33.1	36.9	39.0	39.6	38.3	36.2	34.2	32.5	33.0	33.0	32.0	32.6	33.0
25th	—	31.8	32.0	33.0	32.8	32.8	32.7	29.9	28.3	26.1	29.2	33.6	36.6	38.9	39.9	39.9	38.0	33.0	33.0	33.8	34.0	31.7	28.9	29.0
26th	29.8	27.0	25.9	23.7	29.8	30.9	33.0	35.7	29.4	30.8	23.2	32.0	35.3	38.0	39.5	40.7	38.5	36.6	34.1	—	33.5	33.3	27.2	30.2
27th	30.1	29.1	30.9	32.0	29.1	31.3	35.0	33.9	33.0	29.8	31.5	33.0	34.3	36.4	36.3	37.3	36.9	35.0	32.9	32.2	33.1	32.8	33.5	32.9
28th	34.5	31.1	31.8	33.6	36.7	32.5	32.6	32.0	30.0	30.0	31.1	33.0	35.1	38.7	39.6	39.9	35.1	35.3	34.6	33.3	30.4	32.6	31.9	33.0
29th	33.1	33.4	34.9	33.3	34.5	—	35.0	30.9	29.3	28.4	30.2	33.0	37.9	40.1	41.4	40.0	37.8	35.1	34.5	34.3	33.9	33.3	32.7	30.0
30th	30.5	32.5	32.8	34.9	33.1	34.0	33.9	30.7	28.4	27.1	28.0	31.6	35.0	39.0	40.2	39.7	36.9	35.5	34.4	33.8	33.7	33.0	32.9	32.9
31st	32.9	32.8	32.8	34.0	33.0	34.2	32.9	31.1	28.1	25.7	27.0	30.7	34.2	37.9	41.1	41.0	38.6	35.9	34.0	33.9	33.8	33.1	33.0	32.2
Means	31.74	31.42	31.68	31.70	31.96	32.06	32.07	30.06	27.97	27.07	28.39	31.55	35.48	38.73	40.31	40.18	33.26	35.78	34.16	33.94	33.06	32.83	32.11	31.68
Normals	32.22	31.76	32.54	33.01	32.28	32.56	32.19	29.86	27.78	26.76	28.67	31.85	35.46	38.73	40.58	40.33	38.26	35.78	34.16	33.94	33.62	32.97	32.54	31.99

MAGNETIC DECLINATION DURING THE MONTH OF APRIL 1861.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	30.9	32.1	33.1	33.1	33.0	32.6	32.1	30.0	28.1	25.3	27.0	31.0	35.1	39.1	41.7	41.3	39.0	36.5	35.9	35.1	34.3	34.0	33.8	33.2
2d	32.9	33.0	32.8	33.0	32.0	32.8	32.0	30.8	28.3	26.8	26.9	31.0	36.1	40.7	42.0	42.5	40.5	37.8	36.0	34.9	34.5	34.0	33.5	33.3
3d	33.0	33.1	32.9	33.0	32.9	32.5	32.3	30.3	27.6	25.9	28.0	31.6	36.9	39.7	41.6	40.7	38.5	36.3	34.9	34.8	34.3	34.0	33.5	33.0
4th	32.4	32.8	32.8	32.3	32.3	32.0	31.4	29.8	29.2	28.5	28.7	32.8	37.1	39.5	40.2	39.2	37.4	35.6	—	34.5	34.3	34.0	33.8	33.0
5th	33.0	33.1	33.0	32.8	32.2	32.0	31.7	29.5	28.0	25.2	28.8	32.7	36.8	39.2	43.1	41.4	38.8	36.2	—	35.8	34.9	33.2	33.1	32.6
6th	31.0	32.0	31.6	31.3	30.7	31.1	31.0	29.7	29.7	28.9	30.8	33.3	35.4	37.2	37.7	37.4	37.0	35.5	35.4	35.0	33.5	31.8	31.2	31.8
7th	31.3	31.1	31.0	30.7	30.0	29.8	29.8	26.2	26.0	26.8	28.8	32.5	35.8	38.1	40.0	39.3	37.0	35.5	34.8	34.0	33.5	32.9	33.0	32.5
8th	32.0	31.8	31.4	31.3	31.1	32.1	33.9	29.3	30.0	29.9	31.0	33.1	36.2	39.2	40.0	39.7	37.6	35.0	34.9	34.0	34.1	33.9	32.0	34.5
9th	31.0	33.9	33.5	35.6	31.9	31.9	31.3	30.0	29.4	31.5	29.6	34.1	36.7	39.3	39.2	38.2	36.8	34.0	33.6	33.4	33.0	33.0	32.9	32.9
10th	32.8	32.1	32.0	31.9	32.0	32.0	32.8	33.4	33.7	33.0	31.2	34.1	35.1	36.1	37.3	36.9	36.1	34.6	34.0	33.8	33.2	33.0	32.9	32.8
11th	32.8	32.7	32.8	32.8	32.2	32.0	31.8	30.0	28.9	28.0	29.0	32.0	33.7	35.0	35.7	35.1	33.8	32.9	32.4	32.0	31.4	31.0	30.9	30.4
12th	30.2	30.0	30.0	30.0	29.1	29.0	30.7	28.8	29.3	27.4	28.5	30.7	33.2	34.3	36.2	35.1	33.9	32.0	30.2	29.0	28.9	28.6	28.0	27.3
13th	27.1	28.0	28.4	27.7	28.7	28.0	27.6	26.4	25.7	26.3	29.0	31.3	33.2	35.2	37.0	37.5	37.0	34.2	33.1	31.5	28.8	29.1	25.9	28.1
14th	28.1	28.6	27.9	29.0	28.9	27.9	27.0	25.4	25.3	27.3	29.9	32.2	33.9	35.1	36.0	35.0	33.2	31.6	30.0	28.9	27.4	27.8	28.2	28.4
15th	28.0	28.3	28.8	29.8	29.7	30.4	28.8	—	—	26.1	27.3	29.5	32.3	35.5	37.1	35.9	33.7	34.3	35.5	33.0	31.7	30.0	30.1	19.6
16th	22.8	26.8	25.0	20.6	21.1	29.3	27.8	29.4	32.1	34.6	32.0	28.6	30.9	34.6	37.2	34.0	31.5	27.0	—	24.5	21.0	26.8	29.8	30.6
17th	30.9	30.0	32.2	28.7	31.3	30.8	31.0	29.6	30.3	30.9	31.1	33.1	35.1	36.6	38.3	39.2	35.5	34.7	34.1	33.3	33.4	33.1	32.2	32.5
18th	33.0	33.0	33.7	33.4	33.0	33.0	32.7	31.1	30.1	28.7	29.4	31.7	35.1	37.8	38.1	37.0	35.3	34.9	34.5	35.1	35.1	33.7	33.0	32.0
19th	31.7	31.7	32.8	32.1	32.2	32.2	32.2	31.3	30.7	29.5	29.6	31.3	34.7	37.6	38.8	38.0	36.2	35.0	34.5	33.8	33.5	33.4	33.2	33.0
20th	32.1	32.1	34.0	33.4	32.5	34.5	32.0	31.2	30.1	29.7	31.0	32.6	34.7	36.9	37.0	36.5	35.6	34.1	33.0	32.5	32.1	31.6	31.0	31.0
21st	31.1	30.3	30.1	31.0	33.0	32.7	31.0	29.2	28.0	27.8	31.1	32.6	35.0	35.8	36.8	35.2	34.1	32.3	31.4	30.6	27.2	28.1	28.4	28.5
22d	28.0	30.9	31.1	30.4	32.0	31.1	32.0	31.1	29.0	29.5	28.4	31.3	35.6	37.0	37.0	34.6	33.0	31.0	30.0	29.2	28.1	28.7	29.1	29.1
23d	28.7	29.8	28.0	29.9	28.1	29.7	30.0	28.1	27.0	30.0	31.4	34.4	34.2	36.0	37.1	36.9	34.1	33.2	30.0	30.7	29.5	27.0	28.9	28.0
24th	27.0	27.1	28.1	28.3	28.8	28.5	29.1	29.9	27.2	27.4	28.7	30.2	33.7	35.6	36.6	37.3	36.0	33.8	31.5	28.8	28.9	28.7	28.6	28.2
25th	27.5	27.5	28.2	28.4	26.7	26.3	25.7	24.7	25.0	27.8	29.0	30.8	34.0	36.6	39.0	39.5	37.0	35.6	33.0	28.6	29.9	28.2	27.3	27.0
26th	28.0	28.4	28.5	27.5	27.0	27.0	27.3	27.0	27.2	29.2	30.5	31.9	34.7	37.7	38.5	38.7	35.8	34.3	33.1	32.3	31.1	29.2	27.4	28.6
27th	28.7	29.5	29.9	30.3	30.7	30.0	29.7	28.2	28.7	29.5	29.0	30.0	33.7	35.9	37.3	37.3	36.5	35.0	34.5	34.5	33.3	32.4	31.4	31.0
28th	31.7	31.1	30.2	30.4	30.0	29.0	30.0	28.0	26.8	27.5	28.1	30.4	32.6	35.5	36.2	37.0	35.6	34.3	34.0	33.2	33.0	32.1	31.3	31.0
29th	30.9	30.7	33.1	29.6	29.1	29.8	29.5	28.0	27.7	28.3	29.9	33.7	34.4	35.2	37.3	37.0	36.5	35.0	34.0	33.1	32.2	31.1	30.6	29.8
30th	28.6	29.0	—	29.3	29.8	30.0	29.1	27.4	26.8	26.7	28.9	31.0	34.3	36.7	39.5	38.0	38.0	35.2	34.2	32.1	31.9	31.0	31.3	—
Means	30.23	30.68	30.92	30.59	30.43	30.67	30.44	29.10	28.48	28.47	29.42	31.85	34.67	36.96	38.32	37.71	36.10	34.23	33.43	32.40	31.60	31.18	30.88	31.16
Normals	30.74	31.08	31.14	30.76	31.04	30.82	30.62	29.24	28.27	27.96	29.42	31.85	34.98	36.83	37.73	37.39	36.11	34.48	34.01	33.36	33.00	31.90	31.32	33.13

FLAGSTAFF OBSERVATORY.

27

MAGNETIC DECLINATION DURING THE MONTH OF MAY 1961.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	32.3	32.0	32.7	32.9	32.7	31.9	32.0	30.7	29.0	28.6	28.1	29.0	30.7	34.0	35.0	36.0	35.0	33.0	30.8	29.9	29.0	27.5	27.1	27.9
2d	28.0	28.7	28.8	27.8	27.6	28.9	29.0	28.7	28.7	29.0	28.8	30.4	33.1	35.6	37.6	37.0	36.6	34.6	32.7	31.9	31.4	31.5	31.5	31.0
3d	30.1	29.6	29.2	29.7	29.8	29.7	29.8	29.3	28.9	28.5	27.8	29.0	32.8	35.6	37.1	37.7	36.5	35.0	33.0	33.8	31.0	30.8	30.4	30.7
4th	31.0	30.9	30.0	28.8	29.5	29.0	29.1	27.3	25.6	25.2	27.5	29.7	32.0	35.0	36.4	36.0	34.5	32.5	30.6	29.7	29.0	29.0	29.0	28.8
5th	29.6	29.1	28.7	28.0	27.0	25.9	25.9	—	26.1	28.2	29.0	31.7	33.5	35.3	35.4	35.2	34.7	35.0	36.0	28.2	31.1	31.0	30.0	30.0
6th	30.0	29.0	29.5	29.0	29.0	28.3	—	26.4	27.0	29.4	29.6	30.7	34.2	35.8	36.5	36.1	35.1	34.2	33.7	33.3	33.1	32.3	33.0	33.0
7th	32.2	32.5	32.5	32.7	32.3	32.1	32.6	32.0	31.3	31.0	29.7	30.5	32.4	34.1	36.2	36.1	35.9	33.9	29.0	33.1	32.8	31.4	32.0	32.9
8th	31.7	32.4	33.0	33.1	32.5	32.6	—	32.0	30.7	29.4	28.8	29.3	31.6	34.1	35.1	35.0	34.9	34.0	34.0	33.0	32.7	33.0	30.2	32.0
9th	30.8	32.0	33.1	33.0	32.7	32.8	32.3	33.0	34.0	30.4	—	—	—	34.2	34.4	34.5	—	32.2	32.9	31.0	31.0	30.5	30.6	30.5
10th	29.2	30.3	30.0	30.0	29.9	30.0	30.0	28.9	28.2	27.7	27.5	30.2	33.2	36.2	37.0	36.5	34.6	32.2	31.3	30.1	30.0	31.5	29.6	28.9
11th	29.0	29.5	29.7	30.1	31.0	30.7	30.5	30.5	28.5	28.0	28.0	28.6	32.8	34.0	36.0	34.7	33.1	31.1	31.9	30.0	29.4	23.3	28.0	28.0
12th	28.2	28.2	28.0	28.4	28.2	27.9	27.5	27.0	26.6	26.2	26.9	27.7	29.1	29.9	29.3	29.6	29.7	28.2	28.9	28.8	28.9	28.7	29.0	28.8
13th	27.9	29.0	28.8	29.1	29.1	29.5	31.5	31.4	30.8	29.8	28.9	30.4	33.0	35.0	35.7	35.6	34.0	31.7	30.3	29.8	29.0	28.1	27.8	27.6
14th	27.8	28.0	27.1	27.4	27.2	27.1	27.0	26.1	24.7	24.5	26.0	27.5	29.2	32.0	33.2	32.4	31.0	29.2	29.4	27.3	27.8	27.1	27.3	26.1
15th	26.0	24.5	24.7	25.1	25.2	25.9	25.9	25.9	23.0	24.1	27.0	30.0	32.6	33.9	34.8	34.4	33.6	31.5	29.1	28.4	28.0	27.2	26.0	25.4
16th	27.0	28.1	29.0	29.3	29.5	29.3	—	28.0	27.3	27.8	29.7	31.1	33.7	35.7	36.0	36.2	34.0	32.8	22.5	31.0	28.7	25.5	25.1	22.8
17th	27.5	24.9	26.9	26.5	27.4	27.5	26.9	28.0	35.0	29.0	29.7	29.6	31.8	32.6	33.9	33.0	33.0	29.6	27.1	24.7	21.4	25.9	23.0	24.4
18th	20.5	24.2	25.0	26.1	27.7	28.6	34.4	30.2	30.4	28.6	30.6	31.0	31.5	32.9	34.2	34.4	35.9	34.8	32.1	29.5	28.6	27.5	25.6	26.1
19th	24.6	24.4	25.0	26.3	28.1	28.1	30.0	29.8	26.8	27.1	29.6	32.1	33.9	34.6	35.5	34.4	34.7	31.0	25.3	28.0	27.8	25.9	26.0	25.8
20th	25.7	30.0	28.1	27.0	26.5	25.0	24.5	26.0	26.9	26.8	28.1	30.1	30.6	31.2	32.0	30.0	28.0	25.6	25.2	25.0	24.8	24.5	23.8	—
21st	23.9	25.7	25.5	24.1	23.8	22.2	22.3	23.3	23.0	24.6	26.8	29.9	32.5	34.5	36.0	35.2	33.4	30.5	28.7	27.0	26.0	25.0	24.9	24.4
22d	24.5	26.8	28.0	29.0	28.7	29.6	29.1	28.6	28.7	28.5	29.0	31.1	32.9	34.2	35.0	35.8	34.3	33.0	30.0	28.8	27.9	28.3	28.1	27.9
23d	27.0	29.0	28.2	27.5	28.5	28.3	28.4	26.0	25.9	28.4	30.0	30.8	32.0	33.1	36.0	36.0	36.0	38.8	37.0	37.1	33.3	30.0	28.0	29.6
24th	29.9	30.6	30.7	32.5	32.6	33.1	34.0	33.2	31.3	30.3	30.0	29.7	30.7	32.3	33.9	34.5	33.6	33.1	32.3	32.2	32.8	32.0	31.2	31.0
25th	31.2	31.2	31.5	31.1	29.9	32.2	32.0	31.5	31.3	30.3	29.0	29.8	32.5	34.5	35.4	37.0	35.2	32.9	32.3	31.9	31.2	31.0	30.9	30.2
26th	29.8	30.0	30.3	30.3	30.7	31.2	30.0	29.0	28.0	30.6	31.0	31.6	33.5	34.7	36.0	36.9	35.5	32.3	32.3	32.2	30.1	30.6	29.9	29.8
27th	28.5	29.4	29.7	30.0	29.7	30.7	30.8	31.0	30.0	29.9	29.9	30.5	32.3	34.5	35.3	36.0	34.5	33.8	34.8	31.5	32.0	28.9	28.6	26.2
28th	27.0	28.0	27.9	28.0	28.3	28.6	28.7	27.6	26.1	26.1	27.7	30.0	32.3	33.0	35.2	37.0	37.0	34.0	32.0	31.0	30.0	28.3	29.0	29.9
29th	29.1	30.5	31.5	30.8	29.7	29.6	32.8	28.5	27.9	28.9	30.5	31.0	31.9	33.1	35.1	35.0	34.7	34.5	31.8	33.4	33.0	31.0	29.9	23.9
30th	28.1	28.4	27.5	27.0	25.4	24.0	23.6	25.5	23.6	25.5	—	32.0	—	—	35.1	—	—	—	32.0	31.9	31.1	31.5	29.8	27.6
31st	26.8	26.3	27.0	26.8	27.6	29.0	28.9	27.5	26.8	27.0	28.6	—	—	—	—	—	—	31.9	31.1	30.9	31.0	30.8	30.8	30.8
Means	28.22	28.81	28.95	28.95	28.96	29.01	29.27	28.76	28.13	28.05	28.75	30.17	32.22	33.99	35.14	35.11	34.25	32.56	30.92	30.47	29.81	29.22	28.61	28.38
Normals	28.55	29.21	28.96	28.50	28.72	29.47	29.80	28.38	28.35	28.44	28.75	30.17	32.22	34.13	35.34	35.50	34.81	32.89	31.26	30.90	30.31	29.83	29.11	28.61

MAGNETIC DECLINATION DURING THE MONTH OF JUNE 1961.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	31.0	30.9	30.8	31.0	31.0	31.0	30.8	31.0	30.5	29.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	28.6	28.1	27.7	—	27.1	26.7	26.1	26.3	25.0
5th	25.1	23.2	25.8	28.0	27.0	27.1	26.9	26.7	26.3	25.4	—	—	—	28.7	28.5	29.4	29.1	28.3	27.8	27.8	27.0	26.0	25.7	24.7
6th	25.9	26.4	26.8	27.3	27.2	27.5	27.2	26.4	27.3	26.0	—	24.7	—	27.5	30.0	—	—	27.4	27.5	26.8	26.9	26.9	26.0	25.5
7th	25.2	26.9	27.6	28.0	27.8	—	—	27.2	27.3	27.0	26.2	26.2	26.9	28.5	28.1	28.7	28.6	—	27.4	27.4	27.5	26.8	27.0	27.1
8th	27.6	27.8	28.1	28.5	30.0	27.8	29.0	27.1	27.6	26.8	26.0	26.6	28.0	30.4	30.7	31.0	29.2	27.6	27.9	27.8	26.1	27.0	26.9	27.3
9th	27.0	27.6	28.0	28.0	28.4	28.0	29.8	28.5	27.7	27.0	26.4	27.2	28.0	29.2	31.0	31.0	29.9	28.7	28.0	28.1	28.0	28.0	27.5	28.2
10th	28.0	28.6	28.6	28.5	28.9	—	28.6	29.7	29.0	28.8	28.5	28.4	29.2	30.2	30.9	31.5	31.0	29.9	29.4	29.6	29.5	29.0	29.0	29.1
11th	29.4	29.8	30.1	30.2	30.3	30.3	30.1	30.0	29.7	29.0	28.3	28.8	30.0	31.1	31.7	32.1	31.4	30.4	30.0	30.0	29.6	29.6	29.6	30.0
12th	30.7	30.8	30.9	31.6	35.1	30.1	30.0	29.9	30.7	32.0	31.1	31.0	31.0	32.7	32.9	33.3	33.2	31.1	31.1	31.9	32.9	30.1	29.0	25.1
13th	29.7	29.7	30.7	31.3	31.2	32.0	32.1	34.3	33.8	30.9	34.0	34.1	32.9	32.2	32.2	34.8	33.3	30.0	31.9	30.4	29.0	29.4	27.6	33.9
14th	26.8	31.0	28.7	29.0	30.7	33.1	33.5	33.0	32.7	29.0	30.3	31.2	—	30.3	32.6	33.0	33.0	31.0	29.0	28.7	30.0	29.2	29.7	29.7
15th	30.0	29.0	33.2	31.6	31.0	31.3	30.9	32.8	33.3	30.0	29.6	28.6	30.6	31.7	33.1	33.0	32.6	31.1	30.3	31.0	30.1	30.0	29.0	29.0
16th	28.2	28.7	29.0	29.1	32.5	30.9	32.1	31.5	30.9	29.1	28.4	29.4	31.2	31.9	32.7	33.7	32.5	31.4	30.9	31.3	26.9	29.0	29.9	29.9
17th	30.5	30.9	31.3	30.9	31.4	31.4	31.0	30.7	30.3	30.3	29.0	29.6	30.5	31.7	33.0	33.1	33.0	31.3	30.8	31.2	29.5	30.4	30.1	29.3
18th	30.2	30.6	31.6	32.0	31.4	31.0	30.7	31.7	30.8	30.0	29.1	29.0	30.0	31.8	32.5	34.6	31.9	31.9	29.7	30.1	31.0	30.6	30.4	30.1
19th	30.5	30.5	30.9	31.0	31.0	30.8	30.8	30.5	29.8	29.1	29.0	29.0	30.6	32.0	33.2	33.8	32.9	31.5	31.2	31.2	30.9	29.9	30.0	30.4
20th	30.4	29.0	30.8	30.6	31.1	31.1	30.6	31.0	30.3	29.8	29.4	29.2	29.9	31.1	32.8	33.2	32.8	31.5	31.7	31.5	31.6	30.7	29.7	28.4
21st	29.5	30.6	31.4	31.6	30.5	30.8	31.0	30.2	30.3	29.7	29.5	28.7	29.9	32.2	34.7	35.5	35.1	33.6	33.4	32.7	32.6	30.4	30.1	30.1
22d	30.3	30.3	29.6	31.1	30.1	30.2	30.8	30.7	31.0	30.2	29.2	29.2	31.0	32.5	33.4	33.1	32.7	31.1	30.8	31.0	30.8	30.2	30.1	30.1
23d	30.5	30.9	31.3	29.2	30.9	29.7	32.4	31.1	32.0	30.3	30.0	30.4	29.8	32.0	33.6	32.8	35.1	33.8	32.8	31.2	29.9	29.9	29.2	29.9
24th	29.3	27.4	30.5	30.1	31.6	30.5	31.1	30.5	30.8	30.0	29.0	29.0	30.2	31.8	32.5	33.2	33.1	31.6	31.0	30.8	30.5	30.1	30.3	28.1
25th	28.6	29.9	29.7	30.4	30.0	29.9	30.6	31.0	30.3	29.3	23.0	29.0	30.6	32.9	34.0	34.4	33.3	31.4	32.2	30.0	31.0	30.0	30.1	28.8
26th	26.9	29.1	30.8	30.7	30.9	29.9	30.8	32.0	31.3	30.0	30.2	29.3	31.9	31.8	33.4	34.8	33.2	32.0	33.3	33.1	31.9	29.0	29.7	30.0
27th	29.7	29.9	30.0	30.5	29.8	30.3	30.5	31.3	31.7	30.8	29.7	30.9	31.2	32.9	36.2	35.7	34.0	32.3	31.4	31.3	31.1	30.8	30.9	30.0
28th	30.7	30.5	31.3	30.1	31.2	31.1	31.1	31.0	31.1	30.0	29.1	28.8	29.0	31.5	34.0	35.0	34.2	32.6	33.6	34.0	33.9	31.8	30.8	30.4
29th	29.9	28.8	29.0	30.0	31.1	31.6	31.3	31.7	31.3	30.6	29.8	30.0	31.4	32.7	34.9	35.0	34.2	33.0	31.0	32.1	31.2	31.0	31.0	30.9
30th	31.0	31.2	31.6	31.2	31.3	31.3	32.3	31.2	31.2	29.7	28.8	28.8	30.8	32.1	33.2	34.8	33.0	32.7	31.6	31.5	31.1	31.4	30.8	29.5
Means	28.99	29.26	29.89	30.06	30.50	30.35	30.64	30.47	30.33	29.29	28.92	29.08	30.20	31.29	32.53	33.04	32.33	30.96	30.60	30.36	29.90	29.38	29.13	28.91
Normals	29.29	29.49	30.05	30.06	30.45	30.35	30.91	30.95	30.36	29.57	28.95	29.06	30.20	31.44	32.74	33.58	32.99	31.40	30.30	30.49	29.89	29.65	29.39	29.38

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF JULY 1861.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	30.6	30.1	30.3	32.2	32.3	32.0	31.8	32.2	30.0	30.0	29.1	30.0	32.9	34.0	34.2	35.0	34.1	33.0	33.0	33.6	32.9	31.9	30.9	30.9
2d	32.6	30.6	36.0	31.6	31.1	32.1	31.9	32.2	31.4	30.1	30.1	31.0	32.1	34.0	35.8	35.5	34.0	32.2	32.4	32.3	32.5	32.8	32.0	31.9
3d	31.2	31.5	31.6	31.7	32.5	32.0	31.8	31.2	31.0	30.3	30.0	30.6	31.8	33.7	34.7	35.2	34.1	32.4	32.0	31.6	31.6	31.5	31.5	29.0
4th	30.9	31.8	31.2	31.6	31.9	31.4	31.5	30.9	31.4	30.5	29.2	29.6	30.6	31.8	33.7	35.2	34.8	33.2	33.1	32.4	31.6	32.5	31.5	31.3
5th	31.2	31.7	32.1	35.2	31.8	33.0	32.8	32.6	34.0	30.3	28.9	29.2	30.8	32.9	34.2	35.3	34.5	32.6	32.0	32.1	31.8	31.4	30.9	31.6
6th	31.7	32.0	32.4	32.3	33.0	32.2	31.9	31.6	31.2	30.0	28.0	27.9	29.0	31.0	34.4	35.2	34.2	32.7	32.0	31.8	31.7	31.6	31.1	32.0
7th	32.0	32.0	32.5	32.5	33.0	32.2	32.1	31.5	31.4	30.1	28.4	29.5	31.3	33.6	35.3	36.0	34.3	32.5	31.7	31.5	31.7	31.7	31.8	32.0
8th	31.2	33.1	32.1	32.7	32.5	32.0	31.9	31.2	30.8	—	—	—	—	—	—	—	—	—	31.9	31.8	31.5	31.7	31.9	32.0
9th	32.0	32.2	32.2	32.3	32.7	32.4	32.2	32.2	32.1	30.8	—	—	—	—	34.5	—	—	—	35.0	34.6	31.8	32.1	27.2	28.7
10th	29.6	26.1	30.7	30.3	33.0	31.7	33.1	32.6	35.7	32.3	31.2	30.8	31.9	32.3	33.7	34.6	34.1	32.9	32.6	30.2	32.8	30.8	31.0	31.0
11th	31.5	—	31.6	33.3	36.0	31.1	33.5	35.6	35.0	29.6	31.2	30.9	30.2	33.3	34.3	36.7	35.1	33.4	30.2	32.2	32.9	27.8	30.0	31.5
12th	27.9	28.4	29.9	31.3	34.1	32.1	32.8	33.4	34.2	31.2	30.0	29.9	31.0	33.3	34.0	35.0	34.8	31.7	32.0	31.9	31.0	30.4	27.0	31.3
13th	31.8	32.0	32.0	32.8	32.8	33.2	32.5	33.0	33.2	29.9	29.9	31.0	—	—	35.5	36.2	—	—	30.4	31.0	32.0	31.1	30.3	31.3
14th	32.1	32.1	29.9	33.3	33.0	33.2	33.0	33.1	33.9	31.2	30.9	30.0	31.3	32.0	34.4	34.9	34.8	33.3	32.5	32.7	32.1	31.5	31.4	30.9
15th	30.9	31.6	32.3	32.2	33.0	35.0	34.5	33.6	34.3	35.0	33.1	31.9	31.3	32.7	34.6	34.6	34.5	33.1	32.5	32.2	31.8	31.7	31.7	31.8
16th	31.6	31.5	32.7	32.0	32.1	32.8	32.4	32.8	31.6	31.0	29.9	29.7	30.3	32.3	34.1	35.9	35.0	33.6	33.2	32.5	32.2	32.0	31.9	31.8
17th	30.6	32.8	32.0	31.9	33.0	32.4	32.5	32.3	32.1	32.1	30.0	29.1	30.1	32.0	34.8	35.3	34.3	32.9	32.2	32.8	32.4	32.1	32.0	31.7
18th	32.1	32.7	32.8	32.8	33.0	33.1	32.7	33.2	31.0	31.4	29.8	30.6	32.8	35.1	36.2	34.2	33.3	32.2	32.2	32.2	32.0	31.5	31.6	31.3
19th	31.3	31.0	32.0	32.0	31.5	32.0	32.0	32.7	32.0	32.7	29.7	29.9	—	—	32.0	—	34.1	—	32.9	33.2	32.6	31.5	31.6	31.6
20th	32.0	31.6	31.5	33.1	30.9	31.6	31.6	31.3	32.0	30.8	30.3	30.5	30.9	32.1	34.4	35.1	34.0	32.8	32.2	32.0	32.5	31.8	32.0	32.1
21st	31.4	31.6	28.1	30.2	32.1	31.4	32.0	33.2	34.4	32.0	29.1	30.7	32.7	35.9	35.6	36.1	36.2	36.5	35.6	35.0	33.3	29.8	28.8	30.3
22d	29.9	30.8	33.1	32.7	32.7	35.5	32.7	32.0	31.2	30.2	31.6	30.1	32.0	34.9	36.1	36.2	34.8	33.3	33.5	34.5	28.4	32.0	32.0	32.0
23d	32.3	31.6	31.4	31.0	32.8	32.0	32.2	31.8	33.0	31.8	31.0	31.4	32.0	33.1	34.3	—	34.4	33.0	33.0	34.0	33.5	31.7	32.0	27.9
24th	31.8	32.4	32.1	32.1	32.5	32.2	32.2	32.4	33.2	31.6	31.0	30.5	—	—	35.0	—	35.2	—	—	33.4	32.1	32.4	32.0	31.8
25th	30.2	31.0	32.1	32.1	31.8	32.0	32.6	32.9	33.5	33.0	28.7	31.1	30.0	32.0	38.0	—	37.7	—	—	—	—	—	—	—
26th	—	—	—	—	—	—	—	—	—	32.2	31.0	30.5	31.5	33.0	35.0	37.2	37.0	34.0	35.6	29.9	33.3	31.2	31.6	31.0
27th	30.9	32.2	32.3	32.5	33.0	32.2	31.3	31.8	32.6	31.1	29.1	28.8	30.3	32.6	36.5	37.7	—	33.1	37.0	34.9	32.7	32.1	31.6	31.6
28th	31.6	31.2	32.0	33.0	33.0	32.9	32.7	32.2	32.2	32.0	—	29.8	29.0	32.0	35.4	36.9	35.8	35.1	33.9	33.3	32.1	32.0	32.0	32.0
29th	31.9	32.0	32.0	32.9	33.0	33.0	33.0	31.8	31.6	30.3	29.4	29.0	29.6	31.8	35.0	35.8	36.0	34.0	33.2	33.0	32.6	32.0	31.7	31.5
30th	31.6	32.4	32.2	32.9	33.1	32.1	32.8	32.2	32.0	30.8	29.8	29.8	31.4	35.0	36.1	36.6	36.6	34.1	—	33.1	33.0	31.9	31.6	31.4
31st	32.0	32.0	32.0	32.0	32.0	32.1	32.0	31.9	32.0	30.3	30.5	30.6	31.4	33.1	35.1	37.0	35.6	33.4	33.0	32.8	32.1	32.0	31.9	31.7
Means	31.28	31.45	31.84	32.28	32.63	32.39	32.41	32.36	32.54	31.14	30.09	30.81	31.00	32.93	34.86	35.82	34.97	33.28	32.89	32.62	32.35	31.48	31.14	31.23
Normals	31.40	31.64	31.82	32.28	32.52	32.39	32.41	32.36	32.54	31.01	30.09	30.81	31.00	32.93	34.86	35.82	34.97	33.15	32.73	32.62	32.35	31.61	31.43	31.23

MAGNETIC DECLINATION DURING THE MONTH OF AUGUST 1861.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	31.8	32.0	32.1	32.7	32.1	32.2	32.3	31.8	31.5	30.6	29.2	28.8	29.1	31.3	33.7	34.6	34.0	33.0	32.9	32.5	32.1	32.1	32.0	32.0
2d	31.0	31.3	29.1	32.0	32.1	33.0	31.1	30.9	34.4	31.1	31.1	30.7	31.2	32.8	35.5	37.0	36.7	34.4	33.3	33.0	32.5	32.7	27.9	28.6
3d	31.1	32.3	33.4	33.1	32.8	37.8	39.1	42.8	37.5	39.0	35.8	35.9	32.0	33.0	33.7	35.3	35.7	33.8	32.8	32.3	32.4	32.9	32.6	32.5
4th	32.4	32.4	32.7	32.7	32.2	32.0	32.0	32.4	32.1	30.6	29.9	29.8	30.1	32.0	34.2	35.8	36.0	34.4	33.5	33.4	33.1	32.1	29.1	30.1
5th	31.1	32.1	33.3	33.8	32.2	33.1	32.4	32.0	31.6	34.0	30.6	30.0	30.4	32.0	34.1	35.2	37.0	36.3	34.0	34.3	33.8	32.4	32.5	32.0
6th	31.1	31.2	32.1	32.0	32.0	32.0	31.9	33.0	32.8	31.7	30.1	29.6	29.6	34.2	33.6	34.7	36.6	38.2	34.7	37.0	31.7	25.0	30.1	31.4
7th	32.5	31.4	32.3	34.0	31.9	32.9	36.2	33.1	33.0	31.6	30.0	29.8	30.8	32.2	34.1	34.9	34.9	34.1	33.0	32.8	32.8	32.1	30.2	31.7
8th	32.7	32.5	33.2	33.0	33.0	32.5	32.2	32.1	31.8	33.3	32.1	29.3	30.5	32.0	35.0	35.7	36.0	34.2	33.0	32.3	30.8	31.9	32.3	32.2
9th	32.2	32.7	32.8	33.2	33.1	32.9	32.3	32.6	32.7	33.1	33.6	34.0	31.0	33.0	35.3	35.2	35.2	33.8	32.9	32.6	32.5	32.0	32.0	32.0
10th	32.4	32.6	33.0	33.0	33.1	32.6	32.4	32.6	32.3	31.1	30.6	30.9	31.4	34.0	35.0	34.8	36.0	36.4	33.9	33.1	32.3	32.2	32.0	32.0
11th	27.8	29.0	30.8	31.8	31.5	—	32.6	32.2	32.0	31.2	30.5	30.0	30.8	32.1	34.0	35.1	35.5	35.3	33.8	33.0	33.2	32.7	31.2	32.0
12th	31.4	31.4	32.1	32.0	30.1	32.1	32.2	32.7	33.0	31.4	31.0	30.0	29.9	31.9	33.1	33.6	34.3	33.3	33.0	32.7	32.6	32.4	32.4	32.1
13th	31.1	32.3	33.0	32.8	32.0	32.9	31.9	32.4	32.2	32.0	31.5	31.6	32.4	34.0	34.8	34.9	34.6	33.6	32.9	32.8	32.8	32.1	32.3	32.4
14th	32.4	32.6	32.6	32.9	32.6	32.3	32.1	32.1	32.0	31.1	30.1	30.1	31.1	33.7	35.0	35.1	35.1	34.3	—	33.8	32.7	33.0	30.1	30.8
15th	30.7	29.2	31.1	28.1	30.5	32.4	30.9	31.2	31.4	31.1	32.0	33.0	32.8	34.0	36.1	37.5	37.7	38.2	38.0	36.1	34.1	32.9	32.0	27.5
16th	27.3	27.5	29.9	30.8	32.3	32.0	32.2	32.3	32.4	31.2	31.1	31.3	32.7	34.0	34.8	36.0	35.5	34.9	—	31.1	32.5	32.0	31.2	31.6
17th	31.7	31.0	31.1	32.0	32.9	33.0	32.7	33.0	32.4	32.0	30.5	30.0	32.0	33.6	33.9	36.1	34.1	34.9	33.2	31.6	34.0	31.7	26.9	29.6
18th	29.4	30.0	31.0	31.8	32.7	32.6	32.5	32.0	31.5	30.4	29.4	29.0	29.4	32.0	35.3	35.8	38.0	36.7	36.8	37.7	34.1	33.6	26.0	29.7
19th	25.8	18.7	27.3	34.2	34.0	32.9	31.6	34.3	37.5	36.1	33.0	32.9	36.9	34.0	34.0	35.3	34.6	32.7	30.6	27.2	30.2	27.8	26.7	13.3
20th	21.9	28.2	21.0	25.5	28.0	32.0	31.0	31.5	32.0	31.6	30.0	29.7	31.6	34.8	36.6	36.0	36.8	33.1	31.8	34.3	32.3	31.0	30.2	31.1
21st	32.2	32.5	32.3	32.1	33.0	32.2	32.9	33.0	32.6	31.0	30.6	30.0	31.8	33.2	35.2	37.5	36.2	35.3	30.1	33.4	28.9	32.2	32.6	31.1
22d	30.2	31.0	32.0	32.7	32.2	32.9	32.6	33.9	33.5	31.2	30.0	29.5	32.6	33.5	36.8	36.9	38.0	35.5	32.2	33.1	33.0	28.9	28.4	32.5
23d	32.1	31.4	31.1	31.6	27.5	32.1	32.8	34.0	33.0	30.8	30.1	29.5	32.0	36.0	39.7	39.0	36.3	35.0	31.3	33.7	34.0	32.9	31.8	27.8
24th	33.0	32.5	31.8	31.8	32.1	32.3	32.0	33.5	32.0	31.0	29.9	29.6	31.0	33.7	34.0	37.6	38.1	35.7	34.3	33.0	32.9	32.5	32.2	30.9
25th	32.0	25.8	30.6	26.4	30.7	33.0	32.8	32.4	34.6	33.7	31.0	30.2	30.6	33.3	36.1	37.7	36.3	36.1	34.6	33.8	28.4	32.1	31.7	31.0
26th	31.4	29.3	32.4	32.1	32.3	32.8	32.8	33.0	32.9	33.2	31.0	30.5	31.7	33.6	35.2	36.7	37.1	35.1	34.0	33.1	33.2	33.0	32.7	32.3
27th	31.8	31.5	32.0	32.6	32.1	32.3	32.5	34.9	33.3	31.5	30.0	28.2	28.2	31.0	34.3	35.1	36.3	34.8	33.4	33.5	33.5	33.5	32.0	31.2
28th	31.3	31.5	32.0	32.3	32.0	32.0	32.6	33.0	33.4	32.0	31.2	30.2	31.0	32.9	35.1	36.0	36.4	35.0	34.0	34.0	34.0	33.8	34.1	32.6
29th	31.2	32.3	33.0	32.2	32.3	32.6	32.5	33.1	32.6	31.0	29.8	28.9	31.2	34.2	36.1	37.6	37.2	35.2	33.6	33.5	33.2	33.0	33.0	32.5
30th	32.1	32.6	32.5	32.5	32.5	32.6	32.9	32.2	31.1	30.4	29.6	29.9	31.1	33.6	36.0	35.8	36.0	34.5	33.6	33.4	32.8	32.4	33.2	32.6
31st	33.0	33.0	33.1	32.3	32.5	32.8	32.4	33.1	32.0	30.9	29.4	29.8	32.1	34.5	38.0	36.3	36.0	34.7	34.0	33.4	33.1	33.2	32.8	32.4
Means	30.91	30.77	31.51	31.94	31.95	32.69	32.59	33.00	32.81	31.97	30.80	30.41	31.26	33.23	35.10	35.99	36.07	34.92	33.39	33.28	32.57	32.00	31.10	30.69
Normals	31.68	31.49	32.01	32.50	32.23	32.52	32.24	32.68	32.49	31.58	30.63	30.23	31.07	33.23	34.95	35.99	36.07	34.92	33.09	33.20	32.83	32.51	31.59	31.53

FLAGSTAFF OBSERVATORY.

29

MAGNETIC DECLINATION DURING THE MONTH OF SEPTEMBER 1861. Value of a part of division = 1.071 min

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	32.3	32.4	32.7	32.5	32.5	32.4	32.4	33.4	32.0	30.1	29.9	29.9	31.4	33.3	35.4	35.6	35.4	34.9	33.8	33.3	33.2	33.1	33.0	32.9
2d	33.0	32.9	33.0	33.0	32.7	32.5	32.1	31.3	31.8	29.9	30.5	32.0	33.0	34.0	35.8	37.7	38.6	38.8	35.4	33.5	33.2	32.9	32.5	31.1
3d	31.6	32.1	35.3	32.1	32.2	32.3	32.2	32.3	30.4	28.6	28.8	30.2	31.4	33.9	38.0	38.9	36.1	35.2	33.5	34.0	33.5	28.6	32.0	32.6
4th	32.2	30.9	29.9	30.9	33.7	33.2	35.8	35.6	31.6	29.2	29.8	30.9	32.9	—	37.0	36.7	36.0	34.2	34.0	33.2	31.9	32.9	32.8	29.8
5th	32.5	32.3	32.9	33.0	32.7	33.1	35.0	33.9	32.2	29.6	28.5	30.0	31.3	34.1	35.7	36.2	35.3	34.2	33.5	33.2	31.2	32.6	32.5	31.3
6th	30.8	31.3	34.0	34.7	33.9	33.0	32.9	34.6	33.7	32.2	30.1	29.7	31.9	34.0	36.2	36.4	30.9	34.0	32.1	32.6	33.0	33.0	32.9	32.4
7th	32.1	32.0	33.0	33.4	34.0	33.0	33.8	33.2	33.4	30.1	29.9	30.4	33.0	35.3	36.3	36.5	35.7	34.1	33.3	33.3	33.0	32.1	32.0	32.9
8th	32.9	33.0	33.0	33.4	33.7	35.0	34.6	34.1	32.0	30.4	29.9	30.7	32.3	34.9	37.0	38.0	37.0	35.0	33.9	33.4	33.0	32.5	30.3	25.1
9th	29.3	31.1	32.0	31.0	35.0	35.5	30.6	33.0	32.1	31.9	30.1	31.9	32.7	35.0	37.0	37.3	36.8	35.0	33.1	33.4	32.9	32.9	32.9	32.7
10th	32.1	32.6	32.8	33.0	33.0	32.7	32.9	33.2	31.9	30.0	29.0	29.0	30.5	33.3	35.5	37.0	36.6	35.0	33.8	33.8	33.2	33.0	33.2	33.1
11th	33.2	33.1	33.2	33.2	33.5	33.6	33.4	33.6	32.5	31.3	30.5	30.6	31.7	35.8	37.6	38.0	37.0	35.0	33.7	33.8	33.5	33.4	33.0	32.8
12th	33.0	33.0	34.9	33.9	33.7	33.4	33.7	33.0	32.5	29.9	29.0	29.5	32.0	35.0	37.1	38.0	37.1	36.0	35.0	34.7	34.0	33.2	33.0	33.0
13th	33.0	33.1	33.1	33.0	33.2	33.2	34.0	33.0	31.1	29.3	29.7	29.9	31.9	34.0	36.2	37.0	37.2	36.8	36.4	35.7	34.6	32.3	32.9	32.7
14th	33.0	33.0	33.0	33.0	32.6	32.7	32.8	33.2	30.9	28.7	27.7	28.1	31.0	33.6	36.6	37.4	37.1	36.3	35.8	35.3	32.2	32.8	31.0	31.0
15th	31.1	32.8	33.1	33.3	33.2	33.1	33.1	32.7	31.0	28.5	27.0	27.1	29.8	33.1	36.0	37.0	37.1	36.6	35.1	34.5	34.7	28.9	33.2	29.0
16th	31.0	29.0	30.4	32.2	30.2	30.3	29.0	33.2	35.0	37.6	33.0	33.6	34.1	34.2	36.0	41.3	36.9	38.5	28.7	32.1	31.5	24.4	30.8	32.0
17th	28.8	29.8	29.0	30.0	32.2	32.2	33.2	32.0	31.9	30.0	29.9	29.9	32.0	36.0	36.8	37.7	37.2	36.3	36.0	33.7	33.0	33.2	32.9	32.0
18th	32.1	32.8	31.9	32.5	33.0	34.1	34.0	33.4	31.8	30.0	29.0	29.9	32.3	34.8	39.0	38.0	38.4	35.0	33.5	31.0	34.2	32.6	32.2	30.0
19th	32.1	34.2	33.0	34.0	36.0	33.5	34.0	33.2	32.0	30.0	28.6	30.8	34.7	38.7	40.0	39.2	38.8	35.0	34.0	34.5	34.2	30.0	31.8	31.4
20th	26.6	22.0	27.0	28.9	30.9	31.6	32.2	32.5	29.1	27.2	28.7	29.4	32.1	36.4	41.0	42.3	39.2	36.0	35.2	33.0	25.1	30.0	33.3	33.3
21st	32.7	32.7	31.9	34.0	34.0	33.8	33.5	32.1	30.0	27.6	26.1	27.6	33.0	38.0	40.0	40.8	38.4	36.6	34.5	33.8	30.8	32.8	33.0	33.0
22d	32.8	33.0	32.1	33.8	33.5	32.8	32.6	32.7	31.2	29.7	29.3	30.3	34.2	38.0	40.0	40.0	38.0	35.8	34.5	33.7	33.7	33.0	33.3	32.6
23d	32.1	32.9	32.8	34.0	33.0	32.9	32.8	31.4	29.0	27.6	28.0	31.0	34.5	37.8	40.1	40.0	38.0	35.6	34.0	33.6	33.4	33.8	33.5	33.3
24th	32.3	32.0	30.5	31.2	32.1	33.2	33.5	34.8	35.2	35.1	30.6	30.9	33.8	36.3	38.1	38.6	37.0	35.0	34.0	34.0	34.5	34.0	33.9	33.9
25th	32.7	31.5	34.0	33.1	33.1	32.7	33.7	31.6	30.1	32.0	31.8	32.6	34.7	37.1	38.4	38.0	36.1	34.7	34.3	34.0	34.0	33.7	43.0	33.4
26th	30.4	31.4	34.0	33.8	35.2	35.0	32.1	32.0	30.6	27.9	28.8	29.9	32.8	35.0	36.7	37.7	37.0	34.9	34.0	31.2	34.0	32.6	30.9	31.2
27th	31.9	33.7	33.2	33.4	33.6	32.9	34.4	32.6	29.5	28.0	29.0	31.1	33.9	36.2	38.0	39.0	37.9	36.0	34.9	32.6	33.0	32.4	33.0	32.8
28th	32.0	31.7	32.0	32.9	33.2	32.9	32.5	31.0	29.5	27.7	28.2	31.3	34.6	37.0	38.4	38.3	38.0	36.1	34.9	34.5	34.0	33.7	33.5	32.3
29th	32.0	32.6	33.0	32.8	32.4	33.9	32.7	31.6	30.5	30.6	32.0	32.8	34.0	35.9	36.9	37.3	36.9	35.2	35.0	35.0	34.5	33.0	33.1	32.1
30th	31.7	32.6	32.2	32.3	32.5	32.2	33.4	31.0	30.1	28.3	28.6	30.0	33.2	36.0	37.7	38.2	37.0	35.0	34.8	34.4	34.0	33.5	33.2	32.2
Means	31.78	31.92	32.43	32.81	33.15	33.09	33.10	32.84	31.49	29.96	29.37	30.37	32.68	35.40	37.48	38.14	36.96	35.56	34.16	33.63	33.03	32.23	32.95	31.93
Normals	31.96	32.26	32.75	32.94	33.15	33.09	33.24	32.84	31.23	29.50	29.37	30.37	32.68	35.40	37.36	37.99	36.10	35.56	34.34	33.63	33.31	32.78	32.61	32.17

MAGNETIC DECLINATION DURING THE MONTH OF OCTOBER 1861. Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	32.9	33.2	33.2	33.1	33.0	34.9	32.8	32.2	29.8	29.2	30.0	30.9	32.8	35.3	37.4	38.2	37.1	34.9	34.3	33.3	33.3	33.6	33.4	33.2
2d	33.2	33.1	33.1	33.0	33.1	33.0	33.0	30.8	29.7	28.5	29.0	31.9	34.6	36.0	36.4	36.1	35.2	34.0	34.0	33.9	33.5	33.6	33.2	33.3
3d	33.2	33.0	33.0	33.0	35.0	32.3	31.5	31.4	27.8	28.0	29.9	31.4	34.0	37.0	38.1	37.5	36.0	33.7	33.0	33.1	32.2	32.5	32.9	33.0
4th	33.6	34.0	34.3	34.0	33.9	33.6	32.9	30.8	29.5	23.1	29.0	31.5	34.3	36.6	38.4	38.3	36.7	34.4	33.8	33.5	33.8	33.0	34.0	34.0
5th	34.0	34.0	34.1	34.2	34.1	34.1	33.9	31.8	29.6	28.8	29.4	31.7	34.4	37.1	38.7	39.0	37.6	35.2	34.2	33.9	33.6	33.1	32.7	31.8
6th	33.0	33.9	34.0	33.9	34.0	34.0	33.4	32.0	29.4	23.2	28.7	30.5	33.9	36.2	38.1	38.0	37.0	35.5	34.4	34.1	34.0	33.9	33.8	33.4
7th	33.5	33.6	33.5	33.5	33.6	33.0	33.0	32.3	30.2	28.4	27.9	29.8	32.0	34.9	37.4	38.5	37.6	36.0	34.0	34.0	33.4	33.2	33.1	33.3
8th	33.0	32.7	32.7	33.1	33.5	33.5	32.4	33.9	30.9	23.6	23.0	30.1	32.6	35.0	37.9	39.2	38.4	36.2	34.7	33.3	31.0	32.0	31.0	31.0
9th	33.0	32.2	32.9	33.0	34.0	33.2	33.6	30.2	28.4	27.9	27.9	30.1	32.4	35.4	37.0	37.8	36.8	35.1	34.0	33.8	33.4	33.6	33.1	33.0
10th	32.9	33.0	33.0	33.1	33.2	33.2	32.4	30.4	29.0	27.8	28.8	31.0	33.6	36.2	38.1	38.4	37.2	35.9	35.0	36.7	35.0	35.0	27.2	29.4
11th	26.0	26.3	33.3	26.1	22.0	32.7	33.0	31.2	33.0	35.0	31.5	33.5	34.4	36.1	37.7	30.0	35.0	35.0	35.6	33.7	34.0	33.9	29.7	30.0
12th	30.2	30.0	35.8	34.0	34.9	34.0	32.0	31.0	30.0	29.2	29.5	30.2	33.3	36.1	37.0	38.0	33.1	34.8	33.4	33.0	30.0	30.5	29.0	31.6
13th	32.9	35.2	33.2	33.2	33.0	34.8	32.5	30.6	29.0	29.0	30.0	33.1	35.5	38.1	39.1	40.8	39.5	37.9	33.0	34.9	31.5	30.9	30.7	30.0
14th	34.7	34.3	33.7	32.0	35.9	34.0	33.3	32.2	30.5	28.6	27.8	32.0	33.9	36.4	37.6	38.8	37.9	35.8	34.3	33.2	33.0	33.1	27.8	31.0
15th	33.0	33.2	33.9	33.2	34.6	35.9	34.0	30.9	30.0	27.1	27.9	31.1	34.6	38.7	41.0	39.0	33.8	33.0	34.3	34.2	33.2	33.0	32.9	32.5
16th	32.8	33.2	34.8	35.1	34.9	33.0	31.9	29.7	27.1	27.3	27.5	30.5	34.3	38.1	40.0	40.0	33.2	35.5	34.5	34.1	34.4	34.0	28.6	30.2
17th	31.0	33.6	33.7	33.8	33.0	32.8	31.0	28.2	26.0	24.3	27.0	30.6	34.3	37.8	38.4	38.0	36.5	35.0	33.9	33.8	33.8	33.3	33.6	33.7
18th	33.9	33.8	33.8	33.6	33.4	34.2	32.1	29.0	27.8	27.3	28.3	32.0	35.0	38.4	41.8	40.5	37.9	36.0	34.9	34.5	33.8	33.8	33.5	30.3
19th	32.0	33.5	33.3	33.5	33.7	33.0	31.6	29.0	26.9	26.5	28.1	31.7	35.3	38.9	41.0	40.8	38.1	35.7	34.2	33.8	33.6	33.7	33.3	33.0
20th	32.8	33.0	33.4	33.2	33.1	32.8	31.1	28.9	26.7	25.5	26.7	30.2	35.9	39.8	41.3	40.6	38.5	35.9	34.5	33.9	32.8	31.0	31.9	30.8
21st	29.2	30.9	30.9	31.3	31.2	30.9	23.8	25.6	24.8	24.0	26.9	31.2	35.9	40.0	40.6	39.0	36.0	33.8	32.4	32.6	32.7	32.8	32.7	32.6
22d	32.8	32.4	32.2	32.3	32.1	31.7	30.7	29.0	27.1	28.7	29.2	31.8	34.0	36.9	37.9	37.6	35.0	34.0	32.9	32.8	32.6	32.0	32.1	31.8
23d	32.0	32.0	32.1	34.1	32.0	31.8	30.0	27.0	26.0	25.0	26.1	29.4	33.0	36.2	33.6	38.6	37.2	36.1	34.5	33.9	33.0	32.9	32.9	32.5
24th	32.5	32.4	32.3	32.5	32.2	31.8	30.6	29.2	23.0	27.9	29.0	32.4	35.7	33.5	41.0	42.0	40.6	37.7	39.0	37.5	34.1	31.0	27.9	29.9
25th	19.6	26.1	25.8	26.5	32.0	28.8	29.0	23.4	29.3	27.6	29.3	31.7	33.6	38.4	38.8	40.9	36.0	36.9	34.0	34.6	33.8	32.8	32.8	32.7
26th	32.3	30.3	30.0	30.7	30.5	30.8	30.8	30.8	30.0	30.8	31.0	30.4	33.2	35.1	38.0	40.1	33.1	37.4	32.1	34.0	34.1	33.1	33.3	32.8
27th	30.8	30.8	33.0	32.9	33.4	34.0	35.1	32.3	29.8	29.2	30.1	32.0	34.7	37.0	38.6	39.5	37.1	35.5	34.8	33.9	32.7	32.3	32.1	32.3
28th	32.6	33.0	33.0	32.6	32.6	32.1	31.0	29.8	28.2	27.1	27.9	30.9	34.4	38.6	40.0	39.3	37.8	33.9	33.6	34.8	34.9	32.9	31.0	32.8
29th	33.0	33.1	31.9	33.0	30.0	32.1	34.6	32.1	29.5	23.4	23.0	30.0	32.9	34.7	35.4	35.4	34.7	33.7	33.1	33.0	33.6	33.5	33.2	33.2
30th	33.0	33.0	33.0	33.2	33.3	33.0	31.9	30.0	28.0	27.0	27.7	30.2	34.0	37.1	38.8	38.5	37.4	35.6	33.9	34.2	34.1	33.5	32.5	31.9
31st	32.7	33.0	33.1	33.5	35.0	33.1	32.0	29.9	28.4	28.0	29.0	31.9	35.0	37.4	38.4	33.1	37.0	35.4	34.3	34.0	33.9	33.8	33.7	33.0
Means	32.00	32.45	32.90	32.72	32.91	32.97	32.13	30.34	28.72	27.97	28.62	31.15	34.11	37.03	38.68	38.60	37.29	35.69	34.15	34.02	33.32	32.96	32.02	31.76
Normals	32.64	32.88	33.14	33.16	33.27	33.11	32.13	30.50	28.71	27.99	28.62	31.15	34.11	37.03	38.68	38.90	37.29	35.69	33.99	33.90	33.32	32.96	32.81	31.76

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF NOVEMBER 1861.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	33.0	32.9	32.9	32.8	32.7	32.5	30.5	30.0	28.2	27.7	28.0	30.3	34.0	37.3	38.0	38.4	37.8	36.3	35.0	33.8	33.8	33.5	33.6	32.9
2d	31.9	33.2	34.1	35.1	34.0	32.9	32.1	30.5	29.0	28.0	29.2	32.0	36.8	39.8	45.7	39.4	37.3	35.8	34.5	33.8	33.7	33.7	33.6	33.2
3d	31.3	32.0	31.8	32.5	32.7	32.9	31.0	28.7	26.1	28.4	28.7	32.2	36.0	39.0	40.3	38.9	37.0	35.7	34.1	33.1	33.2	33.4	33.3	33.2
4th	33.1	33.0	33.0	33.4	33.3	32.9	32.0	29.2	28.0	27.7	30.1	34.4	37.7	39.8	40.9	40.0	38.0	35.7	33.8	33.4	33.5	33.2	33.3	33.3
5th	33.2	33.2	33.3	33.5	33.5	33.1	31.8	29.2	27.0	25.9	28.0	32.2	37.1	39.3	40.1	39.0	37.6	35.5	34.0	33.5	33.4	33.4	33.1	33.0
6th	33.0	33.2	33.2	34.0	33.4	32.8	31.5	29.3	28.1	27.3	27.8	32.0	35.9	38.6	40.8	39.9	38.0	36.0	35.4	34.0	33.8	33.8	32.0	31.9
7th	33.0	32.8	33.1	32.9	32.8	32.1	31.2	30.2	28.1	27.9	29.3	32.3	36.4	39.6	41.4	40.5	39.0	37.0	35.2	34.5	34.6	33.6	33.5	27.7
8th	31.6	31.6	26.1	23.0	38.0	33.0	30.1	28.5	25.8	26.3	29.7	31.0	34.0	36.3	39.0	40.3	39.3	36.0	31.7	29.1	33.3	32.8	26.0	29.3
9th	30.3	28.1	33.2	34.0	34.6	35.1	34.0	34.0	27.9	24.9	27.4	29.8	33.0	36.0	38.1	37.6	36.1	35.0	33.8	32.8	32.0	32.1	31.9	31.7
10th	31.7	33.2	32.5	32.9	32.7	32.4	31.2	28.5	27.0	26.9	26.9	30.2	34.9	37.8	38.8	38.5	37.0	35.2	33.8	32.9	33.0	32.1	32.7	33.2
11th	35.0	34.2	33.1	33.0	32.3	32.8	30.7	28.5	27.0	26.7	27.8	30.2	33.5	38.0	39.5	38.6	37.1	35.6	33.2	33.9	33.0	32.4	28.1	38.9
12th	30.9	31.0	32.0	32.4	32.6	32.1	31.0	27.6	26.8	26.0	28.9	33.2	37.1	39.9	40.0	39.0	37.1	35.7	32.6	33.4	33.3	32.9	32.0	30.0
13th	29.0	32.1	32.1	32.1	32.0	30.9	30.5	28.0	27.1	27.6	30.0	33.2	36.0	38.7	40.5	39.5	37.2	36.0	34.4	33.0	33.5	32.1	32.1	32.6
14th	32.9	32.7	32.2	32.9	32.8	32.2	31.0	29.0	28.1	28.1	29.9	33.2	36.5	38.4	39.1	38.0	36.0	34.1	33.8	32.9	43.1	32.5	30.5	29.2
15th	31.3	30.8	31.0	31.9	30.0	29.8	28.5	25.2	25.5	25.8	28.9	33.1	38.0	39.7	40.0	38.2	36.7	35.9	34.0	34.0	31.4	31.6	31.4	31.3
16th	31.8	35.0	32.1	—	31.2	30.5	28.0	25.5	25.2	27.9	29.7	33.6	36.4	39.8	40.4	38.6	37.4	35.0	28.9	32.5	30.9	33.7	29.9	29.0
17th	33.0	32.9	32.6	33.5	32.9	31.6	30.1	27.9	26.9	25.8	27.1	30.3	35.9	39.3	40.2	38.5	36.0	34.6	33.0	33.0	33.0	33.1	33.0	33.0
18th	32.9	33.0	33.0	33.0	32.8	32.0	30.3	27.8	26.2	24.9	28.5	32.9	36.8	37.9	38.1	37.2	36.0	35.0	34.5	33.8	34.0	34.4	33.8	33.0
19th	32.9	33.0	32.8	32.8	32.0	30.8	29.7	28.5	25.6	25.1	27.3	32.3	36.1	38.1	40.3	40.6	38.9	37.7	34.4	31.9	30.0	29.4	30.1	29.9
20th	27.0	26.0	27.3	28.0	30.0	30.2	30.0	28.0	26.0	26.1	27.8	31.9	35.1	38.9	40.0	37.8	35.5	33.9	33.2	33.0	32.5	32.8	33.2	33.1
21st	33.2	33.2	33.1	33.2	33.2	32.6	31.8	29.4	27.2	26.8	28.5	31.8	35.3	37.7	38.6	37.8	36.1	35.0	34.0	33.6	33.5	33.5	33.2	33.1
22d	33.2	33.0	32.9	32.9	32.8	31.4	29.7	27.0	26.0	26.0	28.6	32.0	35.0	37.8	39.0	39.0	37.0	35.7	34.2	33.5	33.4	33.3	33.5	33.0
23d	33.0	32.9	33.5	32.9	32.9	30.9	33.1	28.3	26.0	24.8	28.1	33.4	35.0	38.0	39.0	39.0	37.5	36.0	34.0	33.8	34.0	33.0	31.1	31.5
24th	26.0	27.7	29.0	26.1	28.5	27.7	28.0	35.2	30.0	31.5	31.1	33.0	35.6	36.9	37.0	37.7	35.8	35.5	34.6	34.0	33.5	33.4	25.6	30.5
25th	33.2	33.0	32.9	32.7	32.5	32.1	29.8	29.0	28.3	29.4	30.8	33.0	33.7	36.2	36.4	36.0	35.7	33.6	33.0	33.0	32.9	31.5	32.0	32.5
26th	32.5	33.1	31.1	30.9	31.0	31.0	30.6	28.1	28.0	29.9	29.9	31.7	33.9	35.8	36.4	36.2	35.0	34.1	33.0	33.0	31.0	31.4	28.5	30.2
27th	30.1	28.4	28.0	28.0	30.4	30.9	28.8	27.2	26.8	27.5	29.2	32.2	34.5	37.4	38.7	37.1	36.0	34.9	33.4	33.1	33.0	33.0	33.0	32.8
28th	32.1	31.2	32.0	32.0	32.0	31.8	30.6	29.0	27.0	25.8	25.9	28.1	31.9	34.7	35.2	35.0	34.4	33.9	33.0	32.9	33.1	33.1	33.2	32.0
29th	32.1	32.6	33.2	33.6	32.4	32.9	31.3	30.3	26.3	25.4	27.1	29.6	35.3	37.0	38.0	36.8	35.9	34.8	33.7	33.0	33.0	33.5	33.2	31.0
30th	30.1	31.4	32.2	31.9	31.8	31.1	29.2	28.9	22.6	26.7	29.0	32.0	35.4	32.9	39.1	37.5	35.4	34.2	34.0	34.2	33.9	33.6	32.7	31.8
Means	31.81	32.01	31.98	32.17	32.46	31.83	30.60	28.88	27.09	26.96	28.64	31.90	35.43	37.89	39.29	38.35	36.76	35.35	33.67	33.21	33.34	32.86	31.77	31.59
Normals	32.19	32.70	32.65	32.91	32.40	31.98	30.39	28.72	27.25	26.80	28.64	32.03	35.55	38.18	39.20	38.47	36.76	35.35	33.84	33.36	33.04	32.98	32.50	31.73

MAGNETIC DECLINATION DURING THE MONTH OF DECEMBER 1861.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	31.7	32.8	31.9	31.1	31.6	29.8	27.2	27.0	26.2	27.6	30.3	34.0	36.3	39.1	41.3	39.0	36.2	34.7	33.8	33.1	34.6	34.2	34.0	33.5
2d	33.0	32.0	33.0	31.8	30.8	34.0	31.0	27.8	29.1	27.9	28.9	32.2	36.1	39.3	40.5	38.9	36.3	34.7	33.1	32.7	33.0	33.5	33.8	34.0
3d	33.9	33.7	33.4	33.3	33.2	32.0	31.5	30.1	28.5	27.1	28.5	33.0	36.5	39.5	40.3	38.9	36.4	34.3	33.0	32.9	33.0	33.0	33.1	33.2
4th	33.3	33.2	33.1	33.2	33.0	31.3	29.5	27.1	26.4	25.2	28.0	31.7	35.1	38.0	39.1	39.0	38.0	36.2	34.7	35.5	34.5	34.3	27.3	29.5
5th	26.5	27.4	28.3	26.9	31.8	27.0	24.5	23.8	27.6	25.4	28.2	30.8	34.9	37.0	39.9	38.4	36.0	34.0	35.5	33.0	30.1	29.6	29.9	33.2
6th	31.2	26.0	27.3	30.0	28.3	26.9	25.2	28.4	28.0	28.1	30.0	31.9	35.0	37.0	38.0	38.1	36.8	33.4	33.6	32.2	28.1	31.9	27.9	31.5
7th	30.3	30.3	30.0	31.0	40.7	37.1	36.7	35.6	35.0	29.9	29.0	30.1	33.3	36.0	37.3	36.5	36.8	35.5	34.0	34.3	33.9	33.5	32.8	30.8
8th	30.5	36.9	35.8	32.8	31.5	32.7	30.7	27.8	26.0	25.5	28.1	31.6	34.9	37.0	38.5	39.0	38.0	36.0	33.2	31.9	33.1	32.9	32.1	32.7
9th	33.0	32.9	32.6	32.2	31.5	30.0	28.1	29.0	26.9	28.0	32.4	34.8	36.6	38.0	38.9	36.9	36.3	34.9	33.8	33.3	31.0	30.0	33.0	32.1
10th	32.0	33.0	35.5	33.6	31.6	30.6	30.0	29.2	28.4	29.7	31.7	34.9	37.6	36.4	37.4	37.1	34.0	32.6	32.6	33.7	32.0	29.9	26.0	33.4
11th	28.9	27.1	31.1	31.0	29.9	31.5	28.2	23.0	23.3	27.0	30.8	32.8	36.0	38.5	40.0	39.0	37.8	37.6	36.7	33.3	31.2	34.0	32.0	31.8
12th	27.0	27.1	32.1	33.3	33.0	31.0	28.8	26.2	26.9	26.1	28.8	32.4	34.1	36.7	38.1	38.0	36.5	34.2	33.1	32.4	33.2	33.5	33.6	33.2
13th	33.2	32.9	32.8	32.8	32.0	31.0	28.9	27.0	26.1	25.8	28.0	32.0	34.4	36.3	37.0	36.7	35.2	34.0	33.1	33.2	32.9	33.2	34.0	31.2
14th	33.0	32.7	32.9	32.5	32.4	31.2	31.1	28.0	28.3	27.1	30.0	34.3	37.7	39.1	39.7	39.1	37.9	36.6	34.5	33.9	33.2	33.6	33.2	32.1
15th	33.1	33.0	32.8	32.4	31.9	30.8	29.4	26.9	25.2	24.8	28.6	32.6	36.8	38.5	39.8	38.6	36.8	35.0	33.8	33.0	33.1	33.3	33.0	33.0
16th	32.4	32.0	32.9	32.8	32.5	31.9	28.9	26.0	24.0	23.7	26.3	31.0	36.0	39.3	41.1	40.1	37.9	35.5	34.0	33.1	32.9	33.0	33.2	33.0
17th	32.9	32.5	32.0	31.9	31.2	30.0	28.1	27.2	27.0	26.2	27.0	30.0	35.0	37.7	41.1	40.0	37.4	36.8	35.2	34.0	33.4	33.1	33.4	32.9
18th	32.4	33.0	32.0	32.9	31.2	30.7	27.6	26.5	26.4	26.9	28.2	33.8	36.0	38.4	39.0	38.1	36.0	34.2	33.0	32.1	32.5	30.5	32.7	32.3
19th	31.5	31.6	31.7	31.0	32.1	30.5	29.7	27.9	26.1	25.2	27.8	32.0	35.0	38.9	41.5	42.1	40.1	36.1	34.0	34.8	34.6	32.2	25.0	30.9
20th	32.9	28.0	29.8	31.1	31.3	24.5	19.1	22.9	28.0	24.8	28.0	29.6	33.3	36.5	38.6	38.1	36.4	34.5	32.4	32.0	32.1	32.9	31.8	30.3
21st	30.8	32.2	35.8	32.0	39.4	39.5	37.4	33.0	32.1	28.0	29.2	33.6	36.0	38.2	39.4	38.9	36.3	35.2	33.6	32.8	32.9	33.0	33.0	32.8
22d	32.3	32.9	33.8	33.1	31.7	31.1	29.1	27.2	26.0	24.9	25.6	29.9	35.7	37.9	39.0	38.3	36.7	34.6	33.5	33.0	33.4	33.0	33.1	32.9
23d	33.3	33.1	33.1	33.0	32.5	32.9	30.6	28.7	26.7	24.8	26.6	32.2	35.2	37.6	38.1	37.2	36.0	35.0	33.9	33.0	32.3	33.0	32.9	33.0
24th	32.9	33.6	33.5	33.3	33.0	32.1	31.0	28.8	27.4	26.6	28.2	32.2	35.7	38.3	39.3	38.4	37.2	35.5	34.5	33.8	33.5	33.6	33.6	33.3
25th	23.2	33.6	33.3	33.0	32.8	31.2	29.9	29.5	29.0	28.1	28.8	31.0	34.3	36.3	38.0	38.9	37.9	36.7	35.2	33.5	34.6	33.8	33.2	33.1
26th	33.5	33.3	33.0	33.0	32.5	31.3	30.5	28.7	27.6	27.2	30.0	34.0	38.1	39.6	40.2	38.7	36.5	34.3	33.3	33.5	33.9	33.6	33.4	33.3
27th	33.4	33.1	33.1	33.0	32.6	31.7	30.0	28.7	28.0	27.6	30.0	33.1	35.2	37.1	38.2	37.4	36.0	34.7	34.0	33.7	33.9	33.8	33.8	33.1
28th	33.0	33.1	33.1	33.1	32.6	31.0	28.7	26.9	26.6	28.1	32.1	36.2	37.7	39.3	39.3	37.8	35.8	34.0	34.0	34.0	34.0	33.9	33.8	33.4
29th	33.1	32.1	32.9	32.0	31.4	30.0	28.4	27.0	26.5	27.7	31.0	35.8	39.2	40.0	39.2	37.8	36.1	34.3	33.9	33.9	34.0	32.7	32.7	33.0
30th	33.0	33.2	32.9	32.3	32.0	32.1	29.0	26.9	26.0	26.3	30.1	35.7	40.2	41.7	40.2	38.0	35.5	33.0	32.9	33.3	33.8	33.4	33.0	33.3
31st	33.1	33.0	32.7	32.1	32.1	30.9	29.0	27.1	26.8	27.0	28.7	31.5	35.5	38.1	39.0	37.4	34.6	32.0	32.5	32.9	33.7	33.9	33.7	33.4
Means	32.08	31.98	32.52	32.18	32.39	31.24	29.28	27.75	27.29	26.72	29.00	32.57	35.92	38.11	39.26	38.40	36.63	34.84	33.82	33.28	32.98	32.90	32.20	32.56
Normals	32.57	32.75	32.85	32.35	31.99	31.50	29.42	27.77	26.99	26.72	29.00	32.21	35.66	37.99	39.26	38.28	36.51	34.84	33.82	33.28	33.14	32.90	33.03	32.56

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF JANUARY 1862.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	33.0	32.1	32.1	32.5	31.4	31.9	29.0	26.2	22.3	24.6	31.0	35.9	38.8	40.5	40.8	39.9	36.4	35.0	34.2	34.0	33.8	33.8	33.5	30.0
2d	29.0	31.6	31.8	31.9	33.2	27.0	27.0	23.0	22.3	23.2	26.9	30.4	34.7	36.5	38.1	37.6	36.9	35.7	34.0	33.0	32.5	33.2	31.0	32.2
3d	31.3	30.0	32.0	32.2	32.5	31.2	30.0	29.9	30.0	27.7	30.6	34.7	39.5	42.7	42.0	40.8	39.3	36.5	35.0	34.9	31.4	33.0	32.7	32.8
4th	32.9	32.5	32.4	32.0	31.6	30.7	29.0	27.3	25.6	26.1	29.0	32.2	36.1	38.7	39.1	37.1	35.9	35.0	34.0	34.0	33.8	33.4	33.0	32.1
5th	32.0	32.6	32.1	32.5	32.1	31.0	29.0	26.6	25.5	25.8	30.0	33.5	37.5	39.8	41.4	41.5	39.3	38.8	37.8	36.0	36.0	34.9	33.8	33.4
6th	32.9	31.4	32.0	31.6	31.7	28.9	27.1	24.9	22.2	22.4	26.5	30.2	35.0	38.0	39.2	38.7	37.1	35.7	35.0	34.3	33.7	34.3	33.0	32.9
7th	32.5	32.5	32.6	33.0	31.1	30.9	29.5	27.1	25.9	25.3	27.2	29.9	34.0	37.1	39.3	40.0	39.1	37.3	35.6	34.1	33.2	32.8	33.2	33.0
8th	32.9	32.7	32.6	32.3	32.9	31.0	29.0	27.3	25.8	26.3	28.5	32.0	35.4	37.7	39.2	39.0	38.1	36.9	35.8	32.0	32.7	33.5	33.2	32.2
9th	32.5	32.1	31.6	32.6	32.0	31.3	29.0	27.3	26.6	25.2	27.3	31.9	36.0	38.3	39.5	39.9	38.3	36.2	34.3	34.0	34.0	33.9	33.0	32.3
10th	32.9	32.3	32.6	32.8	32.9	31.6	30.0	27.3	26.8	25.9	27.1	30.7	33.4	36.2	38.1	38.6	37.1	35.7	34.6	34.8	34.0	32.3	32.9	33.2
11th	33.0	33.0	32.8	32.5	32.2	31.1	29.9	28.0	26.5	26.0	29.8	34.0	37.8	39.0	39.5	38.2	38.1	37.2	36.6	35.8	35.8	35.0	33.7	33.0
12th	32.7	32.2	32.1	32.0	32.1	31.8	29.9	27.6	28.1	29.0	32.9	36.4	36.5	38.0	39.6	39.8	36.3	35.0	33.9	30.0	33.7	34.0	34.0	33.3
13th	32.1	33.0	33.0	32.8	33.0	30.9	27.4	27.0	26.2	27.5	30.1	33.7	35.5	37.3	37.0	36.5	34.5	33.2	32.9	33.2	33.6	33.9	33.0	28.0
14th	31.8	31.9	28.8	29.0	32.3	29.3	27.5	29.0	27.1	29.0	29.8	32.8	36.3	37.0	38.1	36.8	34.9	33.6	33.0	31.7	32.0	32.2	31.9	33.2
15th	33.1	32.6	32.0	30.2	30.0	30.0	27.0	26.2	25.5	29.1	34.4	33.2	36.8	35.3	36.3	36.4	34.5	33.0	32.9	33.3	34.0	34.0	33.7	33.6
16th	33.0	32.3	33.1	31.3	28.2	22.0	21.2	27.0	28.4	30.2	33.0	36.1	—	—	—	—	—	—	—	—	—	—	—	—
17th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
21st	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
24th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
26th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
29th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
31st	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Means	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Normals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAGNETIC DECLINATION DURING THE MONTH OF FEBRUARY 1862.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	41.7	34.9	34.8	36.1	39.4	33.3	31.8	23.3	28.8	28.1	28.1	36.1	41.6	41.1	45.1	46.9	33.6	32.1	27.4	31.1	29.6	29.1	32.1	33.6
2d	30.9	33.6	32.1	32.4	31.2	30.9	23.1	26.3	25.7	27.6	29.0	33.1	33.7	35.6	41.3	37.7	40.5	39.0	39.0	38.9	34.1	37.5	33.3	36.0
3d	30.9	31.4	31.9	33.4	33.2	33.8	30.1	29.1	28.4	25.1	30.2	31.3	31.5	40.8	38.1	36.9	31.8	32.2	33.3	31.0	30.1	27.0	27.1	25.9
4th	29.0	29.1	30.5	28.4	29.9	27.2	26.7	28.6	26.8	25.1	26.5	33.1	30.8	38.8	40.3	39.7	36.8	32.7	33.1	31.1	30.3	30.9	30.1	29.1
5th	29.1	28.3	28.4	28.8	30.1	29.9	25.2	24.4	22.4	21.1	21.6	24.0	32.0	31.6	33.9	37.9	38.3	32.0	28.0	30.1	31.0	31.0	29.9	39.2
6th	29.0	28.4	28.4	27.3	27.9	27.6	30.5	30.0	26.3	25.3	27.0	29.6	31.5	34.1	37.9	37.7	37.0	37.1	36.5	35.4	34.9	33.5	30.6	30.5
7th	29.8	27.5	28.4	30.0	29.7	30.5	29.6	27.8	27.8	28.6	28.5	31.0	33.5	36.0	37.5	36.9	36.5	36.3	36.0	34.5	34.3	32.7	30.7	31.9
8th	32.3	31.9	31.6	30.8	34.6	32.0	35.3	33.2	31.0	28.3	30.3	30.9	33.2	35.7	37.2	35.7	35.3	34.4	33.4	32.5	33.3	32.8	33.3	31.5
9th	31.0	30.5	30.8	32.2	32.1	31.8	30.6	29.3	27.6	28.5	30.6	32.8	35.1	35.5	34.6	34.3	34.1	33.5	33.5	33.0	33.5	33.4	33.0	33.0
10th	—	—	—	—	—	—	33.0	30.5	28.4	28.5	29.5	31.3	—	35.4	35.5	—	—	—	34.2	33.5	33.5	33.1	32.6	32.4
11th	32.5	32.3	32.2	31.8	31.7	31.5	30.4	28.5	27.1	26.2	—	—	—	—	36.0	—	—	—	34.0	33.4	33.7	33.4	33.4	33.2
12th	32.8	32.6	32.0	32.5	32.3	31.5	30.5	29.0	27.5	27.1	—	—	—	—	—	—	—	—	—	33.0	33.5	29.3	32.2	32.5
13th	31.2	31.6	31.0	31.4	32.3	31.9	29.8	28.8	27.9	—	—	—	—	—	37.0	—	—	—	—	34.4	31.9	32.5	32.7	32.7
14th	30.6	30.6	29.2	29.7	29.7	28.6	34.7	28.8	36.3	27.5	27.9	29.5	33.6	36.3	37.1	35.5	33.8	33.4	32.6	32.4	32.4	31.9	31.6	32.9
15th	32.3	32.9	31.9	31.9	31.7	34.7	31.5	29.3	26.1	25.5	27.3	30.7	33.7	36.5	37.3	—	—	35.0	34.6	34.7	34.7	34.5	32.9	34.0
16th	33.9	32.7	33.2	33.5	33.3	33.5	32.0	30.7	29.5	27.4	27.7	31.4	35.5	39.1	40.9	39.3	36.8	35.1	34.1	33.9	34.6	34.4	34.5	34.5
17th	34.4	34.6	34.5	33.8	33.7	32.8	31.5	29.4	28.5	27.7	31.0	—	—	38.9	42.0	40.7	39.3	—	34.1	33.8	33.9	33.3	33.1	32.7
18th	32.5	32.7	32.7	32.7	32.6	32.5	31.1	29.3	27.2	26.1	26.7	29.5	33.1	36.9	39.4	39.0	37.3	35.4	33.8	33.6	33.4	33.1	32.8	32.5
19th	32.6	32.8	32.6	32.8	32.9	32.5	31.5	28.6	25.8	24.6	26.4	29.5	33.5	37.2	40.6	41.0	37.9	36.3	35.4	32.5	33.3	32.6	32.7	33.0
20th	32.7	32.9	32.7	33.2	33.0	32.6	31.9	30.3	27.2	25.8	26.5	30.0	33.6	36.6	38.9	39.5	37.5	35.8	34.4	33.6	33.4	31.9	31.2	30.6
21st	30.4	31.3	29.7	31.5	31.8	32.0	31.5	28.3	27.0	25.8	27.8	30.9	34.1	37.1	38.9	40.3	39.0	37.3	35.2	32.4	30.5	32.6	29.7	28.6
22d	31.3	22.3	28.5	28.6	34.5	34.4	26.7	26.6	27.6	23.8	26.4	29.1	29.0	31.5	34.3	35.4	35.5	34.7	33.6	32.0	32.6	32.8	32.7	32.4
23d	31.5	31.7	32.2	32.1	31.9	31.8	31.7	30.5	29.1	27.1	27.8	30.5	31.5	33.7	35.7	37.1	36.6	36.2	34.5	33.5	32.0	32.6	32.6	32.4
24th	31.7	32.0	32.2	32.5	32.3	32.4	32.4	30.7	29.1	28.2	29.3	32.2	34.8	36.7	37.6	37.5	36.6	35.5	34.5	34.3	33.6	33.4	32.9	32.

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF MARCH 1862.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	32.5	32.4	32.4	31.5	29.6	30.1	32.5	32.2	31.5	28.5	29.8	32.5	39.5	41.7	41.0	38.5	36.3	35.6	33.5	33.3	32.3	32.0	32.6	32.9
2d	32.7	32.6	32.5	32.6	32.4	31.7	30.6	28.2	26.3	25.5	27.3	31.9	38.5	40.7	40.7	38.6	35.6	34.0	33.4	33.2	33.0	31.5	31.2	31.7
3d	32.5	32.4	32.3	32.3	32.3	32.4	32.2	29.3	26.6	26.6	28.4	32.2	36.3	38.5	38.3	36.9	35.3	33.8	33.4	33.4	33.2	33.1	32.8	32.6
4th	32.1	31.3	31.9	32.3	32.3	32.1	31.1	28.1	26.2	25.3	27.2	30.6	35.7	38.7	39.8	39.3	37.5	35.8	35.0	32.2	32.4	32.4	32.2	31.5
5th	30.4	32.3	32.5	32.5	32.5	32.0	31.1	28.9	26.5	25.6	28.0	31.3	34.9	38.0	39.0	37.5	35.6	34.0	33.7	33.6	33.5	33.5	33.2	32.8
6th	32.9	32.8	32.6	32.6	32.6	32.5	32.0	30.0	27.5	26.0	28.4	—	35.3	38.7	40.3	39.3	36.8	34.8	33.5	32.8	33.4	28.5	24.8	17.9
7th	21.5	28.3	28.5	29.4	28.5	33.4	34.8	35.0	34.5	31.6	31.0	31.5	34.9	36.5	36.7	36.3	34.4	33.5	32.2	30.6	30.7	31.4	32.1	30.5
8th	32.5	31.8	30.7	32.7	33.0	33.2	32.4	30.0	28.1	27.6	29.1	30.9	33.6	35.5	36.4	36.4	34.8	33.3	32.6	32.4	31.4	33.3	31.6	32.1
9th	30.7	32.1	33.4	34.5	32.6	33.9	32.6	30.8	28.7	28.5	29.2	32.8	35.5	37.5	38.5	37.3	35.8	34.4	33.2	32.5	32.5	32.5	32.5	32.3
10th	32.8	31.6	33.6	33.1	33.2	32.9	33.1	31.2	29.3	28.2	29.1	30.8	33.3	35.0	36.7	37.4	36.6	35.5	33.9	33.5	33.4	33.1	32.6	32.4
11th	32.4	32.3	31.8	32.1	32.3	32.3	31.5	30.1	29.0	28.5	29.4	31.7	34.3	35.5	36.5	36.6	36.1	34.5	33.4	32.3	32.5	32.5	32.5	32.4
12th	31.9	32.1	32.5	31.9	32.3	32.9	32.4	30.6	29.0	27.5	28.8	30.5	34.3	36.6	38.3	40.5	37.9	37.8	36.3	31.4	31.7	30.4	26.4	27.5
13th	30.3	31.2	30.0	29.4	31.3	33.7	32.3	30.2	28.6	27.5	27.9	29.5	31.7	34.3	35.4	35.7	35.1	33.8	32.7	32.8	32.5	31.7	32.6	32.5
14th	32.5	31.5	31.4	32.9	32.5	32.7	33.9	32.5	29.4	28.1	28.9	31.5	33.6	36.2	37.5	37.7	36.1	34.1	33.5	33.6	33.4	33.4	33.3	33.1
15th	32.9	32.6	32.5	32.5	32.5	32.4	31.9	30.4	28.5	26.8	27.3	30.7	34.4	37.3	38.4	38.5	36.8	34.5	33.4	32.7	33.1	31.2	32.4	32.6
16th	32.7	32.2	30.5	32.4	32.2	32.5	31.0	32.4	29.7	27.4	27.5	30.8	34.2	36.8	38.1	37.9	36.6	34.5	33.4	33.5	33.2	33.3	32.7	32.6
17th	32.6	30.5	30.0	31.2	31.6	31.9	31.5	30.4	28.2	27.8	29.4	32.4	35.5	38.3	40.6	42.8	42.3	42.4	38.9	35.5	33.3	30.9	32.5	31.7
18th	28.8	27.0	30.6	32.3	32.0	31.7	31.2	29.6	28.3	28.7	30.5	33.5	35.4	37.5	38.5	39.6	38.6	36.3	33.9	34.3	34.2	34.1	33.9	29.4
19th	32.6	32.9	32.6	30.7	32.7	31.3	30.5	29.7	28.3	26.8	28.5	32.0	35.7	37.4	38.0	37.5	35.6	34.4	33.7	34.2	33.6	29.6	29.9	21.8
20th	30.4	33.1	33.0	32.4	32.2	31.9	31.5	29.5	28.4	28.7	30.1	33.4	35.4	37.3	37.5	37.0	33.4	34.0	33.5	33.5	31.5	31.4	32.6	32.4
21st	30.9	34.3	32.6	32.6	33.0	32.7	33.0	30.8	29.9	29.1	30.1	31.7	34.8	36.8	37.7	37.5	36.8	35.5	34.4	34.0	33.5	33.4	32.5	28.5
22d	30.5	30.4	32.7	29.5	31.0	31.6	31.5	30.5	28.6	28.1	28.4	31.3	35.7	31.9	37.5	36.6	35.3	33.5	33.3	33.5	32.8	33.2	32.7	32.4
23d	32.5	32.3	32.4	32.5	32.3	32.5	32.2	30.5	29.8	28.5	28.9	31.5	34.7	37.4	38.0	37.0	35.9	34.6	33.9	33.3	22.6	33.4	33.3	32.8
24th	32.6	32.5	31.5	32.7	32.7	32.2	31.5	30.4	29.5	30.1	31.6	33.8	35.6	36.5	36.3	36.2	35.5	34.6	34.5	33.9	33.7	33.5	33.3	33.1
25th	32.7	32.8	32.7	32.6	32.5	32.4	31.0	30.8	29.5	28.5	29.1	31.5	35.0	37.5	37.9	37.5	36.1	34.4	33.3	33.3	33.1	33.1	33.1	33.0
26th	32.7	32.6	32.5	32.5	32.4	32.2	31.7	31.0	29.2	27.7	28.1	31.3	34.0	36.7	38.7	39.5	38.4	36.4	35.5	29.0	34.5	33.7	32.5	28.4
27th	31.7	32.4	32.6	32.4	32.1	32.5	31.9	31.5	31.4	30.3	30.1	33.9	36.4	37.4	37.5	37.3	35.7	34.2	34.4	34.4	32.7	33.5	33.1	33.0
28th	32.8	31.9	32.5	32.5	32.5	32.4	31.7	31.1	29.7	28.3	29.7	35.1	37.4	38.4	38.5	37.5	35.7	33.9	33.5	33.5	33.1	32.9	33.3	32.7
29th	32.5	32.8	32.7	32.4	32.4	32.2	31.6	31.4	30.2	29.2	31.0	33.8	36.1	37.5	37.7	36.5	35.0	33.9	33.8	33.6	30.5	33.5	33.5	33.1
30th	32.5	32.6	31.8	32.6	32.7	31.6	32.4	31.3	29.5	28.4	28.8	33.0	35.7	37.7	38.5	37.5	35.5	34.0	—	33.4	33.4	33.4	33.4	33.0
31st	32.8	33.0	32.9	32.5	32.3	32.5	32.2	31.5	29.7	28.5	28.5	31.9	35.1	37.2	38.4	37.4	36.5	34.6	34.3	33.4	35.0	33.2	33.3	32.8
Means	31.82	32.00	32.09	32.15	32.20	32.38	31.98	30.69	29.04	28.05	29.09	32.13	35.29	37.24	38.21	37.85	36.30	34.91	33.98	33.13	32.62	32.52	32.26	31.20
Normals	32.06	32.30	32.21	32.15	32.32	32.38	31.98	30.55	28.85	27.93	29.09	32.13	35.27	37.15	38.21	37.68	36.09	34.66	33.81	33.27	32.95	32.65	32.71	32.42

MAGNETIC DECLINATION DURING THE MONTH OF APRIL 1862.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	32.5	32.5	32.5	32.5	32.5	32.4	32.2	31.1	30.0	29.3	30.3	33.2	36.5	38.3	37.9	37.0	35.3	34.0	34.0	32.5	32.3	32.4	32.3	32.1
2d	31.3	32.1	32.3	32.4	32.3	31.2	31.4	32.5	30.4	28.9	28.6	30.9	33.2	36.5	37.6	37.6	36.5	34.5	32.7	33.5	33.5	27.0	28.5	26.0
3d	33.5	29.7	24.3	26.5	28.8	28.2	31.6	33.3	30.5	28.5	30.1	31.5	33.5	35.2	35.5	34.6	33.8	31.5	30.6	31.6	31.7	28.8	30.5	30.6
4th	32.3	30.4	32.5	35.5	31.9	34.4	33.4	31.0	29.3	27.8	27.8	30.0	32.8	34.7	35.3	35.3	34.3	33.3	31.7	31.0	29.0	30.5	32.5	32.3
5th	32.1	32.5	31.9	32.5	32.6	32.5	32.5	30.5	28.6	27.2	27.7	30.3	33.9	35.6	36.9	36.5	35.0	32.9	32.1	31.6	32.0	32.0	31.9	31.8
6th	32.1	32.2	32.3	32.4	32.8	34.3	31.8	30.5	27.7	27.9	28.6	31.5	33.5	35.5	36.2	35.8	34.3	32.8	32.7	32.5	32.0	32.2	32.2	32.2
7th	31.6	31.9	32.5	32.7	32.5	31.6	31.9	30.9	29.2	27.9	28.3	30.5	33.5	35.9	36.6	36.3	34.6	33.3	—	—	32.5	32.4	32.4	32.3
8th	32.2	31.9	32.5	31.9	32.3	32.2	31.7	30.7	29.3	28.5	28.3	30.5	33.5	35.4	36.3	35.9	34.9	33.6	33.3	32.6	32.5	32.4	32.4	32.4
9th	32.0	32.3	32.3	32.5	32.0	32.0	31.6	30.7	29.3	27.7	28.5	31.0	33.7	35.4	36.5	35.8	34.8	33.8	33.4	32.7	33.0	32.5	32.4	32.5
10th	32.4	32.3	32.1	32.1	32.0	31.8	31.6	30.8	29.5	28.5	28.6	30.8	33.9	36.1	36.7	36.4	34.6	33.8	33.4	31.7	31.6	30.4	29.7	29.5
11th	29.5	31.6	31.5	31.4	29.5	29.8	31.5	30.3	29.8	28.9	29.4	32.5	35.8	39.0	40.7	42.3	40.5	41.3	34.9	30.5	26.1	27.7	22.0	24.6
12th	24.5	26.8	28.5	30.6	27.5	31.7	31.7	28.8	29.6	29.7	30.8	32.3	34.0	36.2	36.3	36.2	34.0	34.5	34.5	32.7	32.4	31.5	31.7	32.6
13th	31.4	32.5	32.0	31.6	31.5	31.6	32.3	32.2	31.0	29.8	30.3	32.4	34.5	35.6	35.5	34.5	33.9	33.0	32.7	32.4	32.4	32.5	32.6	32.6
14th	32.1	32.7	32.5	32.3	32.2	31.9	31.8	31.2	30.1	29.5	29.5	30.6	33.6	35.2	35.6	34.8	33.5	32.5	32.4	32.5	32.1	32.4	32.3	32.5
15th	32.3	31.6	33.0	29.9	29.9	30.7	30.4	31.3	28.9	28.0	27.9	30.1	33.4	36.2	39.5	39.1	39.7	39.3	34.8	32.5	32.3	31.9	31.4	31.0
16th	31.9	32.3	32.1	31.9	32.5	32.4	31.5	30.4	29.2	29.5	30.2	31.6	34.5	36.7	36.6	36.4	38.5	33.4	33.7	32.5	27.7	23.5	31.9	30.5
17th	29.0	33.5	31.9	32.2	32.7	32.1	31.5	31.0	28.4	26.8	27.5	30.3	33.5	35.5	36.6	36.5	35.7	32.0	32.1	32.1	31.4	30.5	30.5	31.0
18th	31.6	32.1	31.7	32.4	32.0	31.4	31.3	31.2	29.4	28.6	28.4	29.5	31.5	34.5	36.8	36.4	35.5	33.9	32.8	32.3	30.5	31.6	31.4	31.

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF MAY 1862.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	30.8	31.0	32.0	32.2	32.4	32.4	31.0	31.0	33.1	29.5	28.5	30.1	32.7	34.5	35.4	35.5	34.5	32.9	32.1	29.4	31.2	30.6	27.2	30.5
2d	30.4	30.3	30.0	31.4	31.0	32.3	31.3	31.6	30.7	28.5	27.3	27.6	29.4	32.2	34.9	35.4	34.5	32.7	31.8	31.5	31.5	31.0	31.0	31.1
3d	31.2	31.2	31.5	31.5	31.7	31.6	31.5	31.6	29.8	27.9	27.5	28.3	30.3	32.8	34.4	34.7	33.9	32.7	32.4	31.5	31.3	30.9	30.9	31.2
4th	31.1	31.5	31.3	31.6	31.7	31.8	31.4	31.5	29.6	28.7	28.6	28.9	30.6	33.5	35.5	35.6	36.6	32.5	32.4	31.3	31.1	30.9	30.5	30.5
5th	30.5	29.4	29.4	29.5	31.3	30.8	31.3	31.3	30.4	29.4	29.3	29.0	29.4	32.5	34.5	36.4	35.5	34.4	32.2	32.5	29.4	30.3	30.5	30.0
6th	31.1	31.5	31.6	31.8	31.8	31.9	—	30.3	29.6	28.7	—	28.7	31.0	33.6	35.6	36.3	34.6	32.7	32.3	29.5	30.7	30.0	29.5	29.9
7th	30.4	30.5	30.5	29.6	33.5	32.4	31.7	32.2	30.5	28.5	28.5	28.5	32.3	34.8	35.9	33.9	34.2	35.9	32.1	31.2	30.4	28.5	28.0	28.4
8th	31.0	31.3	32.4	34.5	38.0	32.3	32.0	31.3	30.2	29.3	27.5	28.5	30.4	32.7	34.5	35.5	34.1	33.0	31.6	31.5	31.5	31.4	30.1	30.5
9th	30.7	31.6	31.5	31.8	31.5	31.5	31.5	31.5	30.4	—	28.8	30.4	31.5	33.6	35.1	34.7	34.2	33.0	32.4	32.1	31.3	30.5	29.4	30.3
10th	31.4	31.7	31.5	32.3	31.6	31.4	31.8	32.0	30.7	30.1	29.5	30.3	30.7	33.3	34.2	35.0	33.7	32.8	32.2	31.7	28.6	30.5	30.3	30.7
11th	30.1	31.0	31.7	35.2	31.5	31.9	32.4	31.8	31.4	30.5	29.9	29.3	30.3	32.4	35.3	35.5	34.2	32.5	31.8	31.5	31.5	31.4	31.4	32.3
12th	31.0	31.5	31.5	31.9	32.4	31.6	31.1	31.5	31.0	29.6	28.7	29.5	31.2	33.0	34.2	35.2	34.0	32.9	30.4	31.7	31.5	29.7	29.5	30.5
13th	30.7	30.7	30.7	33.6	31.0	32.3	32.2	31.7	31.5	29.3	28.1	29.4	30.8	33.2	34.3	34.9	34.2	32.4	31.7	31.6	31.2	31.0	30.8	30.1
14th	28.9	30.2	31.5	31.4	32.5	31.5	31.3	31.1	30.5	29.6	29.5	30.8	32.4	34.1	34.6	35.1	34.4	32.5	31.5	31.5	31.5	30.8	30.6	30.6
15th	31.0	30.9	31.4	31.8	31.5	31.4	28.5	31.3	31.0	29.9	30.2	29.9	31.7	33.5	36.8	34.5	33.7	31.5	30.7	31.5	30.9	30.5	31.7	31.5
16th	31.5	31.7	31.8	32.1	31.7	30.5	31.0	30.8	30.5	28.6	29.4	29.9	31.8	32.6	35.1	36.7	33.5	33.6	33.3	32.7	32.3	29.4	30.5	29.8
17th	30.5	31.1	30.5	30.4	30.5	31.5	31.5	31.5	31.3	29.7	29.5	31.0	31.5	32.5	33.6	35.7	33.9	33.5	31.7	31.0	31.3	30.5	29.3	28.1
18th	30.4	31.4	31.4	31.0	32.3	31.2	31.7	31.7	33.0	30.2	30.6	32.1	32.9	33.2	35.5	37.0	35.5	32.8	33.4	31.6	29.3	29.5	30.7	28.9
19th	23.0	25.5	29.6	30.0	32.1	31.2	31.5	31.0	30.0	29.3	28.8	29.4	30.3	32.3	34.5	35.5	34.1	32.4	31.1	31.3	26.5	30.5	30.3	30.2
20th	31.0	31.5	31.5	31.5	33.0	32.1	32.7	29.8	40.3	32.8	28.1	29.1	—	32.5	33.1	34.5	34.5	35.7	33.4	30.7	29.7	30.9	31.0	31.4
21st	31.6	31.5	31.6	31.5	32.1	32.4	31.6	30.8	30.4	29.5	29.0	29.7	30.9	33.1	34.6	34.6	34.2	33.0	32.3	33.2	32.3	30.2	31.1	32.5
22d	30.6	30.3	31.3	31.8	32.6	31.6	31.5	31.1	30.5	—	30.1	30.7	33.4	33.8	36.2	34.5	34.2	32.9	32.4	32.7	26.7	32.5	31.9	31.6
23d	30.7	31.6	32.5	31.5	31.8	31.5	31.5	31.5	30.5	29.8	29.4	30.2	31.5	33.5	34.9	35.5	34.5	32.9	32.5	31.8	31.5	31.5	31.5	31.5
24th	31.7	32.0	32.2	32.4	32.0	32.1	31.6	32.5	34.5	31.3	30.3	32.0	33.5	33.8	34.8	36.2	35.1	33.6	32.3	31.9	31.5	31.5	34.5	32.0
25th	28.6	30.6	32.0	33.0	32.7	33.4	33.5	32.1	32.5	31.0	29.8	30.5	31.4	33.0	34.3	35.1	34.4	32.5	32.0	32.3	32.0	31.0	31.3	30.8
26th	31.5	32.0	32.2	31.6	30.5	31.5	31.7	31.6	31.5	30.2	30.1	30.9	31.2	32.0	34.2	34.0	35.5	33.7	32.3	29.4	31.2	29.7	30.1	31.3
27th	31.4	31.5	32.5	32.5	32.1	34.5	32.3	32.2	32.0	30.6	29.8	30.1	31.3	33.1	34.0	34.4	—	32.5	31.3	30.0	29.7	30.5	31.3	31.4
28th	31.6	31.9	32.0	32.6	32.4	32.1	31.9	31.7	30.7	29.3	28.6	30.1	32.0	33.3	35.3	34.8	33.7	32.0	31.9	31.5	31.5	31.5	31.0	30.6
29th	31.6	31.8	32.3	32.6	32.4	32.3	32.1	31.8	31.4	29.5	28.5	29.1	31.3	33.7	34.9	35.2	34.3	32.5	32.5	32.5	32.6	32.4	31.1	31.2
30th	30.3	29.4	30.8	33.3	32.6	31.9	33.2	32.3	31.4	30.5	29.5	29.2	30.2	33.0	35.1	37.2	36.7	36.5	34.9	34.5	30.5	27.8	25.4	33.3
31st	27.6	29.5	31.0	27.3	27.9	31.3	35.5	33.8	32.3	30.3	30.5	31.2	30.2	34.5	38.5	37.2	34.5	34.5	33.1	28.5	29.9	29.8	30.2	30.3
Means	30.50	30.94	31.46	31.80	32.05	31.93	31.84	31.60	31.44	29.78	29.18	29.86	31.32	33.26	35.01	35.42	34.55	33.24	32.24	31.52	30.76	30.61	30.46	30.79
Normals	30.75	31.12	31.46	31.85	31.99	31.93	31.71	31.60	31.03	29.78	29.18	29.86	31.32	33.26	34.89	35.42	34.55	33.24	32.24	31.52	31.05	30.60	30.49	30.79

MAGNETIC DECLINATION DURING THE MONTH OF JUNE 1862.

Value of a part of division = 1.071 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	31.0	31.4	32.8	32.5	35.4	33.5	34.0	—	—	32.0	31.4	31.9	32.5	32.5	—	—	—	—	32.4	29.5	31.5	30.4	30.0	31.0
2d	31.3	32.0	32.5	32.5	32.3	32.2	32.7	32.7	32.5	31.1	—	31.5	31.4	33.0	34.0	35.5	34.7	32.7	32.4	32.1	28.0	31.5	31.3	31.4
3d	31.5	31.2	33.1	33.1	32.4	32.3	32.5	32.5	32.7	—	32.2	30.8	31.3	32.8	34.3	35.5	34.6	32.8	32.3	31.8	31.0	31.2	31.3	30.5
4th	30.6	30.6	32.5	31.6	34.0	32.5	33.5	33.7	34.2	31.8	31.2	30.3	29.8	30.7	32.5	34.4	34.9	33.9	32.8	31.6	32.5	30.8	30.9	27.5
5th	31.2	31.5	31.6	32.5	32.9	32.3	32.4	33.1	33.3	32.0	30.8	30.0	29.8	30.8	33.1	34.9	35.2	34.5	33.2	32.6	32.5	32.3	31.4	32.4
6th	32.0	32.2	31.8	32.8	32.9	33.5	32.7	32.2	31.7	29.8	30.4	30.0	31.5	32.9	34.3	36.2	35.5	33.9	33.1	32.4	32.5	32.0	31.8	32.2
7th	32.3	32.4	32.6	32.7	32.5	32.9	32.5	32.4	32.2	30.9	30.5	30.7	31.5	33.2	35.3	36.4	35.9	34.0	33.3	32.9	32.7	32.6	32.5	32.5
8th	32.5	32.8	33.3	33.5	33.5	34.0	32.7	32.6	32.1	31.1	30.6	31.4	32.6	34.4	35.5	35.5	35.0	33.5	32.8	32.6	32.5	32.5	32.5	32.5
9th	32.5	32.6	31.9	32.5	32.7	33.0	32.9	32.3	32.4	31.2	31.0	31.7	33.0	33.8	34.9	35.5	35.6	34.5	33.9	33.5	32.9	32.5	32.5	32.5
10th	32.7	32.7	33.0	33.0	33.0	33.2	33.2	33.1	32.5	31.8	31.5	32.1	33.4	34.5	35.1	35.5	34.9	33.8	33.7	32.3	32.5	32.4	31.9	32.5
11th	32.6	32.9	33.0	33.5	33.3	33.3	33.1	33.2	33.0	—	—	32.2	33.5	34.7	36.1	36.2	36.5	34.5	34.4	34.1	33.5	32.6	32.5	32.7
12th	33.0	32.5	33.3	32.7	33.5	33.0	32.5	33.4	34.2	32.8	31.6	31.1	32.7	35.1	37.5	38.1	37.5	34.0	33.5	33.3	32.6	32.4	32.4	32.0
13th	31.0	31.8	33.2	33.5	32.6	32.4	32.8	33.6	33.0	32.5	31.4	31.4	31.8	33.5	35.1	35.5	35.2	33.9	33.3	32.6	34.3	32.3	31.4	31.5
14th	32.7	32.5	33.5	33.1	33.5	33.1	33.4	33.5	33.4	32.7	31.5	32.2	32.3	34.8	36.2	36.5	35.4	34.2	34.3	33.4	32.7	28.6	31.5	32.3
15th	30.7	30.1	33.0	33.2	34.3	33.4	33.2	33.4	32.6	32.5	32.0	33.1	33.1	35.3	35.3	36.4	35.9	34.5	31.7	32.7	33.1	28.5	31.9	32.6
16th	33.5	33.5	33.7	32.9	34.5	33.3	33.2	34.0	33.6	33.1	32.5	32.9	33.5	34.1	34.6	35.5	35.1	33.5	33.5	33.4	33.3	32.2	32.9	32.6
17th	32.1	33.0	33.3	32.8	34.5	32.6	33.0	33.6	36.3	34.8	31.5	31.5	32.9	33.5	36.3	36.0	36.4	32.1	34.6	34.6	33.3	31.9	30.3	31.5
18th	32.3	32.5	32.0	32.5	33.5	34.6	33.5	34.4	33.3	32.8	33.5	32.3	32.8	35.1	35.7	35.7	35.9	34.3	33.7	33.4	33.4	31.7	32.6	33.0
19th	33.3	33.0	33.0	33.5	33.4	33.6	33.5	33.4	33.0	31.5	30.4	30.3	31.5	32.9	34.3	35.5	35.4	34.0	33.7	33.5	33.4	33.5	33.0	31.4
20th	32.0	32.5	32.8	33.6	33.5	33.4	33.1	33.3	32.7	32.4	31.5	31.9	32.5	33.5	34.8	35.4	35.9	35.2	34.3	36.0	33.5	32.1	32.6	25.3
21st	32.7	31.4	30.6	32.6	34.0	33.5	33.3	32.9	—	—	—	—	—	33.3	34.5	36.3	35.9	35.4	33.6	31.5	31.2	33.5	32.5	32.9
22d	33.4	33.4	33.7	33.8	33.8	33.5	33.5	33.4	31.5	31.2	32.0	34.3	34.3	35.2	36.5	36.1	34.5	33.3	33.2	33.4	33.3	33.2	33.0	33.2
23d	33.3	33.5	33.6	33.6	33.6	33.5	33.4	33.0	32.4	31.5	30.8	30.6	32.3	34.1	35.6	35.5	37.0	34.6	34.4	33.5	33.1	30.7	28.7	30.3
24th	31.5	32.6	33.5	31.7	33.4	34.2	33.5	33.7	34.2	33.3	32.8	32.7	32.6	35.5	36.1	35.7	34.9	33.5	33.0	33.3	32.9	32.7	31.6	32.7
25th	33.0	32.1	33.5	33.5	33.4	33.3	33.6	33.8	33.8	32.4	31.5	32.1	33.2	33.7	35.5	35.6	34.8	34.0	33.0	34.0	32.7	32.8	32.9	32.6
26th	32.8	33.3	33.5	33.7	33.7	33.7	33.5	33.3	32.6	31.5	30.5	—	29.5	30.5	29.0	30.5	39.2	39.5	39.8	42.2	41.4	41.3	41.1	40.4
27th	38.2	36.0	34.3	35.4	42.5	42.6	42.8	42.9	46.6	46.0	46.1	37.2	29.4	40.7	—	49.8	49.6	49.3	50.5	51.3	50.9	50.5	49.5	47.6
28th	39.4	42.5	48.5	49.5	51.8	52.5	54.1	54.0	51.6	47.5	46.5	35.9	39.2	36.5	36.5	37.4	38.5	40.3	41.6	36.3	33.5	34.6	35.3	36.5
29th	36.6	35.5	36.4	37.0	38.3	36.7	35.9	34.5	35.3	36.7	37.9	37.6	40.7	42.0	39.4	40.9	42.5	40.0	40.2	40.7	40.5	40.5	39.9	39.4
30th	39.0	37.3	34.5	34.5	34.5	34.1	43.3	41.0	43.9	42.9	41.3	41.5	40.6	41.5	40.5	40.1	39.5	39.5	39.3	39.2	39.7	41.4	39.1	36.7
Means	33.07	33.06	33.65	33.83	34.62	34.37	34.63	34.64	34.79	33.76	33.17	32.48	32.99	34.62	35.35	36.54	36.67	35.33	34.90	34.47	34.41	33.89	33.41	33.12
Normals	32.27	32.49	33.14	33.15	33.56	33.43	33.28	33.27	33.22	32.11	31.40	31.55	32.38	34.27	35.24	35.93	35.70	34.00	33.42	33.52	33.37	32.85	32.25	32.19

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF JULY 1862.

Value of a part of division = 1.027 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	37.9	37.8	37.3	37.1	36.0	36.4	38.1	—	34.1	32.8	32.8	36.5	40.5	40.2	43.6	43.3	43.1	41.3	41.6	41.7	39.2	38.0	35.7	35.0
2d	39.3	39.2	43.4	44.2	45.5	42.8	42.3	37.9	39.2	36.8	35.8	31.0	39.6	40.4	42.0	41.3	40.4	37.0	36.7	36.7	38.2	38.1	37.9	38.1
3d	37.9	37.6	37.2	37.4	37.3	37.0	37.5	38.1	38.1	38.1	38.0	37.9	33.1	40.2	40.5	42.2	42.1	33.0	17.4	19.8	17.2	20.4	19.7	16.2
4th	14.5	14.2	13.9	13.3	12.5	13.2	13.3	10.9	9.0	7.8	7.5	—	22.5	22.3	20.8	20.0	21.2	27.5	27.9	16.7	15.8	15.6	16.7	18.2
5th	16.2	16.0	15.7	15.5	15.1	15.4	15.3	15.0	15.1	15.1	15.0	12.6	18.2	24.6	28.4	32.8	33.8	34.2	26.0	22.5	18.4	19.7	24.8	20.5
6th	20.9	21.3	21.4	21.4	21.5	22.1	23.1	22.3	22.6	21.8	21.2	21.6	21.6	21.6	21.9	21.9	22.3	21.4	21.0	21.4	21.2	21.1	21.1	20.9
7th	20.5	19.3	19.1	18.8	18.7	17.1	20.1	23.6	21.4	20.4	20.2	31.9	33.8	34.8	35.9	36.3	37.1	36.9	36.7	35.7	35.0	32.9	32.9	27.7
8th	26.6	29.8	31.6	26.6	30.6	32.9	34.0	36.7	40.1	46.5	32.1	34.5	36.5	37.0	37.1	34.9	35.9	36.1	34.0	33.4	33.3	33.3	33.4	33.0
9th	33.8	33.3	34.7	34.1	34.2	34.0	34.2	34.1	34.0	32.4	32.8	30.8	30.9	34.3	37.1	37.4	36.0	29.8	37.1	35.2	34.1	27.2	32.1	32.1
10th	32.1	31.9	35.6	30.1	34.0	34.0	35.5	34.6	33.8	33.0	32.7	37.0	36.0	36.0	—	—	—	39.3	39.9	38.0	37.9	37.6	37.3	—
11th	35.8	37.2	38.3	40.4	38.6	40.1	40.6	40.8	41.1	39.2	—	36.3	36.1	37.1	42.1	40.8	40.3	39.3	37.6	35.1	38.4	38.1	37.1	34.6
12th	35.3	35.0	38.1	38.6	37.9	39.8	40.1	40.1	39.9	38.6	37.1	36.8	37.2	42.5	42.9	42.0	41.4	40.2	39.6	38.7	38.1	39.1	38.5	38.6
13th	39.6	39.8	40.6	40.1	38.9	39.3	39.5	39.4	39.2	39.2	38.3	37.9	39.8	41.7	43.2	43.6	43.0	41.3	41.1	41.0	41.1	41.2	39.4	41.6
14th	32.0	32.1	43.0	42.1	—	43.1	42.1	42.0	42.2	41.4	39.8	40.1	41.8	45.8	48.1	49.1	45.1	41.0	44.1	43.8	40.3	43.1	40.1	40.5
15th	42.1	41.1	41.9	41.9	42.2	41.7	42.6	42.2	40.9	41.0	40.0	40.1	42.3	43.6	45.1	45.8	45.1	44.8	43.6	43.6	40.9	43.1	42.2	42.1
16th	42.2	42.1	42.8	43.0	42.8	43.1	44.3	43.8	43.0	41.8	39.1	39.1	41.8	44.7	42.4	43.1	44.1	43.1	43.2	43.0	42.3	41.0	40.2	40.5
17th	40.8	40.2	40.1	41.9	41.1	42.0	—	41.9	41.6	39.8	38.2	38.4	39.2	40.9	42.1	43.3	41.9	42.6	42.3	42.4	40.5	40.9	40.0	39.4
18th	39.9	40.1	40.6	39.6	41.1	41.0	40.4	4.5	41.1	39.3	37.9	36.3	38.3	39.9	42.1	42.3	44.0	42.1	41.1	41.1	39.2	39.4	39.1	38.1
19th	38.9	39.8	40.3	40.6	40.7	40.4	40.3	40.1	39.8	37.1	34.1	35.1	37.9	40.1	41.5	41.3	41.0	40.0	38.9	39.0	38.1	38.1	37.9	35.4
20th	37.1	37.3	37.6	37.4	38.1	38.1	38.1	37.8	37.6	36.7	33.7	34.2	37.1	38.9	40.5	41.0	40.2	40.1	39.6	39.2	38.7	38.2	38.0	37.2
21st	37.8	38.1	38.8	38.7	38.9	40.4	38.6	37.5	36.9	35.1	33.4	35.8	38.7	40.3	41.1	42.1	41.6	40.2	40.0	39.1	38.3	38.1	38.3	38.4
22d	38.0	37.7	38.0	37.9	37.5	37.1	37.1	36.5	36.0	34.8	33.1	32.3	35.8	38.6	39.1	39.1	38.6	37.2	36.9	36.8	37.1	35.9	36.1	35.9
23d	36.5	37.2	37.3	37.9	40.0	39.9	37.7	37.5	35.5	33.4	32.2	35.1	36.1	37.1	39.2	41.1	40.4	36.6	38.1	37.1	34.3	34.0	33.7	32.5
24th	33.0	34.1	37.3	37.5	40.7	39.5	42.7	40.9	38.2	39.1	35.5	37.2	37.7	42.1	43.1	43.1	44.1	41.0	42.0	38.8	38.0	37.8	37.1	37.0
25th	38.9	40.1	41.9	43.1	43.1	43.1	44.7	39.3	39.5	42.1	40.9	36.9	39.2	40.4	43.9	43.1	40.3	41.1	39.4	38.3	38.1	24.8	37.4	37.7
26th	38.0	39.3	40.0	38.2	39.1	39.1	38.1	36.5	35.9	33.1	31.5	34.2	35.0	34.4	36.1	38.1	36.6	33.3	34.8	34.7	34.0	34.1	33.9	34.8
27th	35.1	36.2	36.1	37.2	37.8	37.6	37.7	37.3	34.4	32.1	31.5	33.7	36.1	38.1	37.7	36.1	36.3	36.4	34.1	34.1	31.9	31.9	32.1	32.1
28th	33.4	33.7	35.1	34.3	33.5	34.1	34.8	35.6	34.2	33.6	35.3	36.1	38.9	39.6	39.9	39.0	35.1	33.1	34.6	32.1	27.3	33.3	32.5	32.1
29th	32.1	33.8	34.4	36.7	36.0	36.1	35.9	35.5	35.1	32.5	29.9	33.8	36.0	38.6	39.8	39.8	38.1	36.1	37.1	37.3	34.9	32.2	32.2	33.6
30th	38.6	37.6	38.1	39.1	38.1	38.9	38.4	37.6	35.1	33.0	33.0	34.4	37.2	37.1	39.6	39.3	38.9	36.1	38.1	38.7	37.6	35.1	34.1	36.0
31st	36.1	35.7	37.1	36.7	37.6	38.6	36.5	36.1	35.8	34.8	32.4	34.6	37.1	38.9	38.3	38.8	37.5	36.1	34.8	34.1	33.1	32.3	32.3	—
Means	34.22	34.47	35.72	35.53	35.64	36.06	36.12	35.74	35.17	34.27	32.50	34.41	36.03	37.80	39.17	39.40	38.85	37.46	36.75	35.78	34.60	34.08	34.32	33.74
Normals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

MAGNETIC DECLINATION DURING THE MONTH OF AUGUST 1862.

Value of a part of division = 1.027 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	32.9	33.3	34.1	34.2	34.4	35.1	35.0	34.2	32.7	31.1	30.5	31.9	34.1	37.2	39.8	39.5	40.1	39.5	38.9	38.5	37.2	36.7	36.6	36.9
2d	37.6	37.1	38.1	38.1	37.8	38.3	38.6	37.5	35.0	32.9	34.2	35.1	37.1	39.9	40.4	40.2	37.8	37.3	36.1	35.3	35.9	34.5	34.9	34.6
3d	34.3	32.8	33.9	34.1	35.6	35.0	—	34.1	32.8	32.3	32.0	33.2	35.8	38.9	39.8	38.5	37.1	35.5	35.4	34.6	34.7	34.3	34.6	32.2
4th	32.1	30.7	33.3	35.9	36.7	36.6	35.7	35.1	33.4	30.0	28.9	31.1	35.1	40.6	42.0	42.3	46.1	46.0	46.9	44.1	39.0	38.1	38.1	33.1
5th	30.1	31.0	34.1	35.0	36.1	36.7	35.9	36.9	40.7	32.1	34.0	53.1	40.8	48.4	46.9	43.1	47.1	41.1	44.9	38.7	29.5	32.3	24.6	25.1
6th	29.1	35.2	39.2	38.6	42.1	38.6	39.4	38.0	36.4	36.5	36.1	37.9	38.3	42.1	41.8	42.5	41.4	39.2	35.3	34.9	32.3	31.9	30.1	28.5
7th	33.1	35.6	36.7	39.1	—	36.8	—	37.2	36.9	34.8	34.1	34.1	36.1	39.1	42.7	42.1	43.6	43.1	38.5	34.9	37.8	38.9	31.1	28.1
8th	36.9	34.4	36.6	38.7	37.6	38.9	39.0	38.3	36.8	34.1	38.1	37.1	36.5	39.1	40.4	41.9	40.8	36.2	31.0	37.1	38.9	37.1	38.1	37.1
9th	35.0	35.8	38.3	38.1	38.6	39.0	38.7	38.5	39.2	34.1	34.1	37.3	38.7	39.2	40.1	39.6	38.6	40.1	37.8	37.6	37.0	35.2	34.4	33.9
10th	37.1	37.6	36.9	37.8	38.6	37.3	43.9	39.7	37.0	34.0	34.3	33.1	34.0	37.6	39.0	39.8	38.1	37.3	35.8	32.6	35.4	34.9	33.4	35.5
11th	34.1	37.1	36.1	35.6	37.1	35.3	35.1	35.3	34.9	33.2	32.1	34.1	35.9	38.0	40.9	40.6	39.6	38.1	37.1	37.8	37.2	37.1	37.6	37.1
12th	37.6	38.2	39.4	39.1	38.9	38.4	38.3	38.3	37.6	37.0	35.8	36.5	38.1	40.3	42.3	42.3	42.5	42.6	41.3	41.1	40.1	39.3	39.0	39.0
13th	38.4	38.2	38.1	40.3	40.2	39.4	39.3	39.3	39.1	36.9	35.2	34.9	36.3	39.3	42.1	43.5	44.4	43.4	43.8	43.3	40.8	39.6	37.8	37.1
14th	38.3	39.4	33.1	41.0	36.6	36.2	40.1	40.5	47.3	41.4	39.3	37.6	37.2	42.1	41.5	43.2	42.4	39.2	37.7	36.7	36.2	35.4	35.5	35.8
15th	29.3	31.1	31.0	43.6	41.5	35.1	40.0	36.1	35.9	34.0	33.1	32.9	33.9	36.7	39.1	40.1	39.1	38.8	39.0	38.6	38.9	38.3	39.2	38.6
16th	38.6	38.9	39.1	39.3	38.9	38.4	38.3	38.1	—	35.1	34.6	35.1	37.1	39.3	41.3	41.5	39.5	39.1	38.3	38.1	38.1	37.7	37.7	38.1
17th	37.8	38.3	38.2	39.8	38.9	39.3	40.1	28.9	36.7	35.4	34.3	34.6	37.1	39.2	41.1	41.4	41.4	40.7	39.6	39.3	38.9	38.7	36.8	38.1
18th	38.7	38.3	38.6	38.9	39.1	38.8	38.6	28.9	37.7	35.3	34.3	34.9	36.5	38.5	39.9	40.0	39.8	39.1	38.6	38.0	37.8	36.9	37.1	37.2
19th	37.6	37.6	37.6	38.8	38.6	37.8	36.4	36.2	34.5	32.4	30.6	33.1	36.9	41.3	37.6	39.1	38.2	38.1	37.1	36.1	36.3	35.8	35.2	35.8
20th	35.7	35.1	35.3	35.7	35.9	35.7	35.6	34.5	32.2	29.1	28.2	29.1	33.1	36.1	37.8	39.2	39.2	35.1	32.9	31.2	28.7	30.1	27.1	31.1
21st	32.4	33.1	32.9	33.3	33.0	32.9	32.4	32.2	29.5	27.2	25.9	26.1	27.9	30.4	33.1	33.4	34.1	33.3	34.1	31.3	31.3	31.2	31.8	32.2
22d	32.6	33.6	34.1	33.7	33.9	34.1	33.6	33.5	32.5	30.0	28.1	28.1	29.7	32.1	34.1	33.9	32.6	32.5	31.3	31.1	31.1	30.8	30.9	31.3
23d	32.1	32.3	32.3	32.6	32.9	34.1	32.5	34.0	33.6	30.3	28.6	29.1	30.3	33.8	35.0	36.7	35.9	34.3	34.1	33.2	33.1	33.0	33.1	32.6
24th	32.3	32.8	34.7	31.5	32.1	33.0	34.9	34.0	31.8	28.4	26.1	27.1	27.5	30.6	32.6	32.7	32.2	31.1	29.8	27.1	28.1	29.1	23.1	26.1
25th	28.1	28.1	28.1	26.9	29.6	29.9	28.9	29.3	27.1	24.8	23.1	21.3	24.0	26.5	28.0	28.1	28.3	27.2	26.1	25.7	26.0	25.1	25.9	26.7
26th	26.8	26.7	26.6	25.1	27.3	27.6	31.9	27.6	26.3	24.5	22.4	23.4	25.2	29.2	30.0	30.3	29.8	27.1	26.7	26.6	28.1	28.6	27.5	26.3
27th	29.7	31.6	31.9	32.6	32.2	32.1	33.1	32.8	28.1	26.1	25.4	26.0	23.6	29.9	31.1	30.1	29.1	28.0	27.1	26.9	26.8	27.3	26.5	27.4
28th	27.4	28.7	29.9	30.4	31.8	31.5	31.2	31.1	28.8	26.3	26.1	26.5	29.9	32.1	33.1	33.1	32.7	31.0	30.3	28.9	29.9	29.2	29.4	29.6
29th	29.3	28.1	19.1	28.1	32.7	32.0	32.2	32.1	29.3	27.1	27.1	28.1	31.1	36.1	35.4	36.7	35.6	33.9	34.4	34.7	28.0	27.1	28.0	23.7
30th	22.6	29.3	29.8	29.9	30.8	32.5	33.6	31.6	29.9	27.8	26.1	27.0	28.0	30.0	32.5	33.1	31.0	29.8	29.1	22.9	29.1	28.9	25.6	14.7
31st	28.1	30.4	30.5	23.6	27.3	29.1	34.1	30.9	28.9	27.9	27.8	28.1	32.0	33.1	35.1	37.3	36.1	33.1	31.8	21.5	28.6	26.2	26.9	29.0
Means	33.05	33.81	34.07	35.10	35.52	35.30	36.04	35.27	34.01	31.61	30.94	32.14	33.60	36.63	37.91	38.21	37.84	36.44	35.40	34.10	33.81	33.48	32.47	32.02
Normals	32.80	33.04	34.19	35.13	37.06	35.83	36.42	35.93	34.43	32.23	33.03	33.61	35.00	38.20	39.39	38.93	38.29	37.54	36.54	34.04	35.26	33.98	33.07	31.96

FLAGSTAFF OBSERVATORY.

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MAGNETIC DECLINATION DURING THE MONTH OF SEPTEMBER 1962. Value of a part of division = 1.027 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	30.6	31.5	32.2	31.6	33.1	32.7	32.2	31.8	32.1	29.0	24.6	25.0	27.1	29.6	31.3	31.8	29.9	20.6	27.9	18.6	25.8	25.2	25.1	24.6
2d	26.5	27.0	28.1	27.1	25.9	27.1	30.2	23.9	22.8	21.9	22.0	19.6	23.1	26.9	23.0	23.2	27.8	26.1	25.2	25.1	19.6	24.5	26.0	25.2
3d	25.0	24.8	25.4	25.1	25.3	24.8	23.7	24.0	21.8	19.9	20.1	—	25.2	29.6	31.9	32.2	32.3	31.5	29.6	30.7	23.2	30.0	29.9	26.1
4th	28.1	31.6	28.0	26.3	29.0	32.2	38.1	35.2	31.0	29.2	30.6	31.5	33.1	33.9	33.7	32.1	33.1	24.3	25.9	30.0	25.6	19.0	25.5	25.8
5th	23.5	28.1	28.3	29.1	31.2	29.3	30.1	30.3	29.0	26.6	23.1	23.7	29.6	32.6	29.9	30.3	31.1	26.6	25.2	29.0	29.1	25.1	28.0	23.1
6th	30.1	29.7	30.1	30.5	32.6	31.8	32.5	31.3	23.4	27.9	23.9	30.1	34.1	35.3	35.1	35.1	34.4	34.1	33.1	27.9	33.0	32.9	33.0	33.3
7th	33.1	34.1	34.6	35.9	35.0	34.9	31.4	33.3	31.8	30.5	29.7	31.0	32.9	35.1	36.9	32.5	36.9	36.1	32.3	27.5	30.3	28.6	28.0	23.4
8th	26.1	29.9	31.2	32.1	32.1	31.6	32.0	23.9	26.8	26.5	26.6	27.9	31.1	33.9	35.6	35.7	34.1	33.1	31.9	31.1	31.0	30.1	30.0	31.8
9th	32.1	32.6	32.9	33.1	33.3	33.8	33.9	32.0	31.9	28.4	29.0	31.7	36.1	37.1	41.1	36.2	33.1	37.4	39.1	35.1	34.0	22.1	22.7	25.4
10th	32.8	33.5	27.2	26.0	31.2	33.6	33.2	33.5	30.2	28.0	26.1	29.1	32.9	35.4	35.7	34.2	32.3	30.8	30.9	30.0	30.9	23.1	21.0	25.2
11th	28.4	30.6	32.3	32.5	33.0	35.1	32.1	29.3	23.4	27.4	23.0	29.7	33.3	35.3	36.0	35.1	34.4	32.2	30.8	29.5	27.9	30.1	31.7	23.1
12th	31.8	32.5	33.1	34.2	33.4	33.7	32.8	31.7	23.6	26.3	26.7	23.3	31.0	32.0	32.7	31.7	29.6	28.5	26.6	26.9	27.0	27.0	26.9	27.6
13th	27.6	28.0	28.1	28.3	28.7	29.2	29.4	27.9	26.2	25.7	27.2	37.2	35.2	36.9	36.8	34.2	31.5	29.6	23.5	27.3	27.2	26.9	27.0	26.8
14th	27.3	27.9	28.3	28.8	28.2	30.3	23.6	26.7	25.3	23.9	25.6	23.3	30.9	32.9	35.2	33.6	32.1	30.9	30.3	29.9	29.8	30.1	30.5	30.7
15th	30.9	31.6	32.1	32.3	31.6	31.8	31.7	29.2	27.2	25.8	27.8	29.6	33.2	35.2	36.7	32.6	31.2	31.8	31.6	31.7	32.4	31.1	30.5	30.8
16th	30.3	30.8	31.4	31.1	32.3	32.2	31.9	30.6	23.7	27.0	27.9	28.9	31.1	32.6	33.5	34.0	32.6	37.2	30.2	28.6	29.5	23.1	23.1	23.6
17th	29.1	29.6	29.7	30.2	31.1	32.0	32.2	30.5	23.4	27.6	23.9	26.0	29.6	30.3	32.8	31.3	31.6	29.3	26.6	26.6	22.8	26.2	24.1	21.6
18th	27.9	27.2	27.3	27.3	27.4	28.1	28.2	24.7	22.4	20.3	21.1	22.7	25.6	28.8	29.8	29.8	29.4	23.1	27.6	28.2	26.5	23.2	23.9	23.5
19th	28.1	30.1	30.6	28.6	30.6	32.0	34.6	30.2	26.7	24.5	25.6	26.7	29.2	30.7	31.6	31.8	29.3	27.6	26.8	25.7	25.6	24.6	25.1	25.3
20th	25.7	24.5	26.0	26.3	26.8	27.9	27.3	27.9	22.6	21.5	22.3	24.4	27.9	29.1	23.8	26.9	25.2	24.5	—	—	—	—	—	—
21st	—	—	—	—	—	—	—	26.3	26.7	24.9	24.9	27.1	29.3	31.8	31.1	32.2	30.8	29.1	—	—	—	—	—	—
22d	32.0	35.3	34.7	34.1	34.2	34.6	34.0	33.2	30.4	29.1	30.3	32.3	35.9	33.6	39.1	33.5	37.0	34.7	34.5	33.2	33.2	33.3	32.9	33.6
23d	33.7	33.6	33.8	33.4	33.4	33.8	32.8	32.0	29.4	23.7	31.5	34.1	37.8	40.1	40.3	33.3	36.8	34.0	33.7	—	33.2	32.6	32.0	32.7
24th	33.7	31.5	32.5	34.0	33.7	32.8	34.4	30.8	27.7	27.2	29.3	31.8	35.9	38.6	39.4	39.3	37.7	35.8	35.5	34.6	34.0	34.5	33.8	31.6
25th	32.3	23.8	25.6	34.0	35.1	29.7	33.9	29.6	28.4	23.3	30.5	33.9	36.9	33.7	39.2	39.1	36.6	35.4	36.5	32.1	29.9	33.5	34.3	31.4
26th	31.1	31.5	28.6	34.7	34.0	33.2	32.0	30.4	28.2	27.7	30.2	33.9	37.8	40.5	44.9	43.7	43.2	38.5	31.2	34.5	31.5	31.9	30.2	31.1
27th	35.7	35.2	35.9	35.5	36.1	34.6	33.3	30.9	29.9	29.0	30.6	35.3	36.2	38.9	39.4	38.6	36.5	34.8	33.4	31.9	30.6	32.0	32.8	31.5
28th	34.0	33.2	35.9	33.8	35.9	33.2	32.4	33.7	31.6	29.9	28.4	31.7	35.3	33.7	40.7	40.1	37.7	35.2	34.6	34.4	34.4	33.0	33.4	32.9
29th	32.6	35.1	34.9	32.4	35.3	31.7	31.2	29.8	27.5	25.8	26.3	29.9	34.1	37.4	38.6	38.6	37.2	35.2	33.5	34.0	33.7	32.7	32.8	33.1
30th	31.9	32.9	31.9	32.4	35.9	31.5	31.7	29.7	27.5	27.3	23.4	31.1	34.9	33.2	39.7	39.7	37.7	35.1	35.1	35.5	34.2	34.5	33.4	32.8
Means	30.07	30.61	30.85	31.06	31.91	31.70	31.89	30.14	27.92	26.53	27.07	29.57	32.21	34.49	35.52	34.58	33.60	31.60	31.00	29.99	29.67	28.96	29.31	28.84
Normals	30.40	31.03	30.56	32.40	32.96	32.45	32.45	30.57	28.21	27.41	27.73	29.76	32.27	34.49	35.33	33.31	33.63	31.99	31.50	29.35	29.67	29.25	29.12	29.74

MAGNETIC DECLINATION DURING THE MONTH OF OCTOBER 1962.

Value of a part of division = 1.049 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	32.8	34.7	35.7	36.3	35.6	35.6	34.6	32.6	31.3	28.6	30.6	33.5	35.9	39.3	41.6	43.6	41.7	39.3	37.4	37.7	37.1	36.2	35.8	35.7
2d	34.3	33.7	34.7	34.8	33.3	33.6	31.7	31.6	30.9	28.2	30.5	34.6	37.8	41.4	42.2	42.6	41.2	38.8	37.3	37.4	37.6	35.6	36.0	35.8
3d	32.8	34.1	34.8	34.6	35.3	35.1	33.8	31.5	30.6	32.5	35.6	38.7	42.3	43.0	41.8	43.5	40.2	38.3	37.8	37.1	38.2	35.1	34.3	33.9
4th	34.8	36.5	37.6	35.4	35.2	43.3	34.4	25.5	43.8	40.8	33.6	36.8	37.6	38.6	43.9	42.4	37.0	38.6	35.7	26.1	27.7	28.8	26.7	27.0
5th	24.3	43.4	28.4	29.1	40.6	41.7	42.9	37.8	35.1	35.7	34.4	34.4	34.2	37.5	38.2	37.5	36.6	35.8	36.2	36.7	37.0	36.8	36.5	36.7
6th	33.1	34.7	33.7	33.8	31.6	28.3	30.6	29.3	30.6	29.5	30.3	34.7	37.3	39.6	43.7	43.0	41.3	40.0	39.6	33.6	35.4	26.5	26.4	27.4
7th	20.8	30.1	19.7	26.0	43.4	37.6	43.0	43.7	38.4	32.8	32.8	33.7	35.6	36.6	38.1	38.1	37.8	37.5	37.0	36.9	37.0	36.3	36.3	36.2
8th	36.1	36.5	36.4	36.2	36.0	35.6	34.6	33.8	32.6	31.6	33.0	36.0	38.1	40.5	40.7	40.5	38.7	37.5	36.8	36.5	36.4	36.6	36.3	36.4
9th	36.4	36.6	36.9	37.5	37.4	35.3	33.7	32.2	30.4	30.7	33.4	37.5	41.2	42.9	42.6	41.6	39.0	38.0	38.6	34.7	35.6	32.8	33.7	31.9
10th	31.2	30.6	33.1	32.8	36.1	39.6	41.3	36.6	33.4	29.1	31.6	35.5	39.6	42.6	42.8	41.6	39.2	37.1	36.6	36.4	36.3	36.5	36.2	36.0
11th	35.8	35.6	35.6	35.7	35.1	35.1	34.7	32.9	31.0	30.1	31.1	34.5	38.4	41.9	47.4	49.8	44.6	42.4	39.2	36.7	32.6	31.6	34.1	32.3
12th	38.8	33.1	34.7	34.3	38.7	37.6	35.8	34.0	28.9	31.5	32.8	35.8	39.0	42.2	41.6	41.6	40.3	39.5	38.6	33.4	33.8	35.1	31.6	33.4
13th	35.7	37.8	36.2	35.7	36.6	38.9	36.9	33.8	32.6	31.6	33.6	37.0	38.0	41.2	42.2	41.6	39.5	39.6	36.9	—	36.0	33.6	35.6	35.8
14th	34.1	35.0	33.6	35.4	36.1	35.3	34.6	33.6	32.2	33.8	39.3	39.7	44.0	47.4	44.8	42.6	39.7	38.0	38.2	—	—	—	—	—
15th	36.4	37.6	37.3	36.0	35.7	36.2	38.2	35.3	34.0	31.0	33.6	34.8	38.3	40.6	41.3	40.7	39.7	37.4	36.6	36.4	33.6	29.3	34.1	32.8
16th	36.7	35.9	36.9	37.0	38.4	35.4	34.6	35.4	32.6	32.4	32.6	34.5	38.5	39.7	40.9	40.0	38.9	38.6	36.7	35.8	36.4	36.2	36.5	35.8
17th	36.7	35.3	37.6	36.2	36.6	36.4	35.8	34.4	34.0	32.5	35.5	36.7	39.6	40.9	41.6	40.8	39.5	38.1	37.1	33.4	36.6	36.1	35.6	35.4
18th	34.3	33.6	41.8	38.4	35.1	37.8	35.1	32.4	30.9	30.2	31.2	33.6	37.8	41.1	42.4	43.1	41.2	39.0	42.1	35.8	35.6	35.6	35.7	35.6
19th	35.6	36.4	35.8	37.9	36.6	34.9	33.6	32.5	31.4	31.6	31.9	36.4	38.9	42.9	43.9	43.4	39.9	38.4	36.8	35.3	34.6	33.4	32.7	35.6
20th	35.7	35.2	37.8	36.4	35.4	35.1	34.4	33.6	31.3	30.6	32.7	36.4	40.1	41.7	42.7	41.6	38.8	36.8	34.8	35.3	34.9	35.8	34.8	35.6
21st	35.5	35.4	35.3	35.5	35.6	35.3	33.9	32.0	30.2	28.8	31.1	33.8	37.1	39.7	41.6	40.7	39.4	37.4	36.3	36.2	36.0	35.6	34.4	34.8
22d	35.4	34.8	34.6	34.7	34.1	34.4	33.8	33.8	30.6	30.0	30.5	33.7	37.4	40.6	42.1	42.0	41.0	41.1	43.2	36.8	31.6	23.5	29.6	28.8
23d	20.8	19.5	22.5	27.1	26.9	36.5	34.4	38.5	31.2	33.7	34.6	36.6	—	39.7	40.7	41.6	37.9	38.3	35.8	34.4	34.1	37.3	34.1	33.9
24th	33.6	33.7	36.3	36.7	35.8	35.1	34.3	32.7	30.7	30.2	31.4	35.7	39.1	34.6	43.3	41.5	39.3	37.6	37.2	36.1	36.5	35.6	33.8	36.8
25th	39.5	35.4	36.4	36.6	37.3	35.6	33.6	32.7	31.4	31.1	32.1	37.1	41.4	42.8	43.6	42.2	40.4	37.6	35.7	36.5	36.4	34.3	32.6	34.6
26th	35.4	35.8	35.4	34.5	36.1	35.5	33.7	31.7	30.3	27.2	31.8	35.8	40.4	41.8	42.4	41.7	40.3	38.6	36.7	33.6	35.3	35.5	35.6	34.9
27th	33.3	33.1	35.4	38.6	36.8	36.5	34.4	32.3	31.3	29.6	31.0	32.9	36.7	40.3	40.7	40.3	38.6	37.5	36.6	36.0	35.9	35.7	35.4	33.7
28th	33.5	35.3	35.7	36.1	37.8	36.2	34.4	—	—	—	—	—	—	39.3	40.7	40.3	38.7	37.3	36.4	36.3	36.2	35.4	35.2	35.4
29th	35.4	35.3	35.1	34.6	34.5	34.0	33.3	30.9	30.9	30.7	32.8	35.0	38.4	40.1	39.9	38.6	37.4	36.5	35.5	35.7	36.6	35.7	31.8	34.2
30th	35.5	34.6	34.6	34.2	37.7	29.0	29.7	2.3	29.0	29.4	31.5	34.0	33.0	40.7	39.9	39.4	38.6	37.7	34.8	36.7	31.3	29.2	32.1	26.4
31st	28.2	31.5	31.4	29.9	34.6	30.4	30.7	32.1	33.2	31.9	33.6	36.1	38.5	40.1	40.7	39.6	37.6	36.2	35.8	35.6	35.4	31.3	32.8	34.2
Means	33.65	34.56	34.57	34.79	36.03	35.73	34.87	33.27	32.18	31.27	32.74	35.54	38.67	41.05	42.05	41.55	39.52	38.23	37.24	35.51	35.18	33.92	33.91	33.90
Normals	34.98	35.24	35.68	35.69	36.09	35.81	34.36	32.97	31.41	30.90	32.51	35.39	38.50	41.35	42.14	41.41	39.35	38.09	36.87	35.84	35.73	35.54	34.62	34.90

FLAGSTAFF OBSERVATORY.

MAGNETIC DECLINATION DURING THE MONTH OF NOVEMBER 1882.

Value of a part of division = 1.049 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	33.4	34.7	34.9	34.8	34.6	34.6	32.9	31.2	30.4	30.6	31.5	35.4	38.8	41.2	42.4	40.4	39.9	37.6	34.9	36.7	36.6	33.4	36.5	32.4
2d	33.7	32.0	32.1	36.2	35.7	34.1	32.4	30.5	29.6	30.6	33.6	36.2	39.6	41.6	41.9	41.4	37.8	38.6	39.0	36.6	34.9	32.8	35.3	36.1
3d	34.6	33.6	34.1	34.7	34.1	33.6	32.6	30.6	28.9	29.1	30.8	33.7	37.5	39.5	40.2	38.7	37.4	36.6	36.6	36.6	36.3	34.8	31.8	
4th	35.8	35.3	34.9	34.9	34.9	34.7	33.4	31.9	30.6	30.4	32.6	35.6	38.6	40.7	41.4	40.4	40.2	38.6	34.7	34.5	29.6	32.6	21.8	29.6
5th	22.5	19.6	18.9	20.6	29.8	31.0	30.6	28.8	27.6	29.7	32.4	35.7	39.4	40.9	41.6	40.2	38.6	37.6	36.7	36.6	37.4	36.3	36.6	36.7
6th	33.6	36.2	35.4	34.9	35.7	33.5	32.8	31.9	31.0	31.1	33.2	36.2	38.8	40.1	41.1	39.9	38.1	37.5	37.5	36.9	36.4	35.1	34.7	32.5
7th	33.8	34.8	35.3	34.8	34.6	32.6	31.3	29.8	30.0	31.5	33.4	36.4	40.4	41.7	44.5	43.9	41.6	41.1	38.3	35.4	36.2	35.8	35.6	31.6
8th	32.9	36.5	35.7	38.0	35.8	32.7	32.1	30.0	29.9	28.9	29.8	35.6	40.2	43.3	43.8	41.8	40.2	38.1	36.6	35.6	36.1	35.8	35.6	33.7
9th	34.1	39.1	38.6	32.6	34.5	34.1	33.6	31.0	31.7	30.6	32.4	37.3	39.3	41.6	41.3	39.9	38.9	34.6	35.6	35.9	36.3	35.8	35.8	36.2
10th	34.4	35.6	35.8	36.4	35.6	38.3	40.9	34.6	30.5	29.4	30.8	36.9	39.3	41.1	41.5	41.1	39.0	37.2	34.1	35.1	36.4	31.7	32.8	35.0
11th	32.4	37.1	33.9	36.6	38.2	36.3	35.1	33.7	31.9	30.5	32.7	33.1	37.5	39.6	40.9	39.9	38.6	37.9	36.8	36.5	36.5	34.8	34.9	33.4
12th	35.7	35.9	37.7	38.6	39.3	36.5	35.6	33.4	31.6	30.5	32.6	35.7	39.8	43.1	43.4	40.8	37.8	35.6	34.8	35.6	36.2	36.1	35.8	35.1
13th	36.3	36.2	35.9	36.8	37.4	36.4	34.9	34.6	31.7	31.4	32.5	35.9	38.6	41.0	42.1	41.7	39.8	38.4	37.6	35.9	35.8	36.6	35.7	34.7
14th	33.7	34.0	33.5	35.3	34.7	34.8	32.5	30.2	29.4	29.3	31.7	35.6	39.1	41.6	43.2	41.7	41.0	39.0	37.6	36.4	36.1	35.6	31.8	33.3
15th	32.9	32.6	35.8	38.1	39.4	35.6	34.6	34.8	32.3	31.9	34.4	35.0	37.8	40.8	43.0	41.8	40.9	38.3	37.4	35.8	36.5	35.6	36.5	31.4
16th	36.2	33.6	33.5	34.7	37.2	36.6	35.8	33.3	31.6	30.4	32.6	33.9	35.7	38.8	40.1	39.7	38.7	37.8	37.1	36.5	36.6	36.6	36.6	36.4
17th	36.3	36.3	36.3	36.6	38.0	37.6	34.4	29.7	29.9	29.5	33.6	35.3	38.8	40.6	42.2	42.7	42.5	40.1	36.7	37.2	33.1	35.5	34.2	35.3
18th	35.7	35.6	34.7	35.3	34.0	32.5	31.7	32.4	35.8	36.4	37.7	39.4	41.7	42.4	43.1	42.4	39.6	37.8	37.8	36.3	34.0	27.9	37.8	39.4
19th	34.6	35.1	34.3	37.5	36.6	33.6	34.3	35.3	33.7	33.6	36.5	38.1	40.7	42.3	42.2	40.5	39.1	37.6	31.5	32.5	37.4	37.4	37.5	34.7
20th	35.4	36.1	33.7	35.7	35.5	34.8	35.3	33.7	31.3	30.6	32.8	36.7	39.7	41.7	41.5	40.9	40.0	37.9	38.6	37.8	36.8	36.1	32.9	35.1
21st	35.9	35.9	34.3	34.8	35.1	35.8	33.6	33.4	32.2	32.3	35.1	37.5	41.3	42.1	42.8	42.9	42.0	41.3	36.3	37.4	36.4	36.6	35.2	34.5
22d	36.7	33.7	36.5	37.1	36.8	35.4	33.5	34.6	32.7	32.5	35.9	40.6	42.1	42.4	42.6	41.5	40.6	36.3	37.9	38.8	37.4	34.6	35.8	35.6
23d	34.0	33.4	35.6	37.1	36.6	35.8	36.5	33.5	31.3	30.6	31.9	35.1	38.7	41.4	41.6	41.1	40.6	39.4	37.8	37.5	31.3	36.6	36.9	36.7
24th	36.5	34.9	34.6	34.8	38.4	36.7	35.3	31.7	29.0	30.4	31.7	36.5	39.6	41.7	43.6	43.6	41.8	—	—	38.5	37.5	36.6	34.5	34.7
25th	37.4	36.4	35.9	36.5	36.1	36.0	37.4	34.2	31.4	30.5	32.6	35.5	40.3	43.6	43.7	42.2	40.7	38.6	38.3	37.6	38.0	37.4	37.6	37.3
26th	37.0	36.6	37.2	37.4	36.6	36.4	34.9	32.1	29.8	30.3	32.3	36.6	40.7	44.4	44.5	42.7	41.6	39.5	37.4	36.2	36.8	36.8	36.9	36.7
27th	35.2	35.6	36.1	6.6	35.7	35.3	34.0	32.1	29.8	30.4	29.5	33.1	37.5	42.4	42.6	42.6	42.6	41.7	38.6	37.7	36.1	32.4	32.6	32.3
28th	34.4	35.7	32.8	39.2	38.3	35.6	39.8	34.4	32.9	32.5	34.6	37.5	41.9	41.1	41.8	41.1	40.1	38.8	38.5	38.6	38.4	37.6	37.6	36.4
29th	35.6	32.9	34.6	35.8	34.9	34.6	33.7	31.1	30.7	30.6	33.1	36.5	40.2	41.5	42.7	41.7	40.4	39.6	38.6	38.5	38.1	37.6	36.6	37.7
30th	37.3	36.6	36.4	36.3	35.3	34.8	33.6	32.7	32.8	33.8	35.0	37.6	39.9	41.4	41.6	40.9	39.8	39.0	38.6	37.8	38.0	37.2	37.7	36.9
Means	34.62	34.74	34.49	35.64	36.00	35.03	34.32	32.39	31.09	31.02	33.00	36.16	39.47	41.54	42.31	41.69	40.02	38.37	36.93	36.65	36.14	35.39	35.27	34.79
Normals	35.04	35.12	35.03	36.29	36.14	35.17	33.76	32.39	30.93	30.83	32.70	35.89	39.60	41.54	42.31	41.69	40.02	38.50	37.18	36.80	36.67	35.92	35.74	35.07

MAGNETIC DECLINATION DURING THE MONTH OF DECEMBER 1882.

Value of a part of division = 1.049 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	37.0	37.1	36.7	36.4	35.6	35.8	34.6	32.5	31.1	31.5	34.6	37.8	41.7	46.6	44.8	43.0	40.6	39.1	39.3	34.6	34.4	35.6	31.6	30.5
2d	32.4	32.0	35.1	35.0	34.6	34.2	33.3	32.5	32.6	37.5	35.7	40.4	44.4	43.8	42.4	41.6	40.8	39.9	38.8	38.6	37.2	35.1	32.5	33.5
3d	34.2	32.9	34.6	30.7	32.6	32.5	31.7	31.9	32.1	31.1	33.8	35.6	37.6	39.2	40.5	40.4	40.1	40.6	41.6	42.1	44.2	—	—	—
4th	35.0	37.3	36.4	36.5	37.1	38.7	34.9	31.7	30.3	32.6	36.4	36.6	38.9	40.6	43.6	42.8	43.4	40.2	30.6	36.3	35.1	33.5	36.5	36.6
5th	30.1	46.2	36.6	35.6	37.4	37.5	35.6	32.3	31.8	30.4	33.0	36.4	40.6	40.5	43.1	42.6	41.1	39.6	36.6	34.5	36.6	38.0	35.8	34.0
6th	35.5	36.4	38.5	35.9	38.6	38.3	36.9	34.8	31.1	31.1	32.7	38.7	41.6	44.2	44.3	41.6	40.6	40.4	37.9	37.6	36.6	33.1	35.6	36.6
7th	36.9	37.4	38.8	38.1	37.0	36.7	38.8	35.1	33.5	31.0	33.4	36.8	39.6	42.7	43.8	42.8	41.6	38.4	39.5	38.4	38.3	32.4	34.9	33.9
8th	38.6	36.5	36.7	37.1	37.9	38.0	36.9	35.0	32.7	32.2	34.8	38.2	41.1	43.4	42.0	41.8	40.9	39.8	38.3	36.4	36.3	36.8	35.3	37.3
9th	37.3	38.2	38.1	37.9	39.1	37.5	36.6	37.5	33.2	32.5	33.7	37.2	40.7	43.4	44.4	43.7	41.8	39.8	38.5	37.5	37.6	37.4	36.6	36.6
10th	37.2	37.0	41.1	37.6	37.0	36.1	35.9	34.6	33.9	30.5	31.6	33.5	38.1	41.6	44.7	44.3	42.5	40.5	38.0	36.1	36.4	36.6	36.6	37.0
11th	37.3	37.4	37.3	37.6	38.3	38.8	38.9	35.7	32.3	29.8	31.2	33.5	37.6	41.8	44.0	43.2	41.8	40.1	38.4	37.9	37.5	36.4	36.9	36.2
12th	34.6	37.0	37.6	38.4	37.4	36.6	35.5	32.9	31.4	30.6	31.3	33.4	36.6	40.1	43.4	43.6	42.6	41.0	39.5	39.5	38.1	37.1	33.7	35.6
13th	36.1	36.9	36.9	39.5	36.6	37.1	36.6	33.9	31.7	28.8	30.9	33.9	37.5	40.3	41.8	42.0	41.9	40.6	39.5	36.6	35.6	36.9	38.7	36.8
14th	36.8	36.6	36.0	36.0	36.2	36.4	35.6	34.0	28.6	29.9	31.2	33.8	38.1	41.8	41.8	42.2	41.9	41.5	41.5	40.1	39.9	39.2	38.6	29.5
15th	28.8	32.7	16.6	24.7	24.4	27.7	50.9	44.4	41.7	41.7	37.8	37.1	44.2	42.5	45.9	40.5	36.9	36.1	36.1	36.9	38.3	37.2	36.5	36.9
16th	36.6	36.5	36.7	35.6	35.6	35.4	33.5	31.3	31.6	33.5	35.5	38.2	40.6	42.1	42.5	40.7	41.3	39.4	42.3	39.6	39.1	37.8	35.8	38.6
17th	34.6	37.6	38.6	36.6	36.6	36.4	35.5	33.4	31.6	31.5	33.4	37.8	41.4	43.6	44.1	44.3	42.6	40.8	40.9	38.3	35.0	37.6	37.5	37.7
18th	37.0	36.6	36.1	37.1	38.8	35.9	34.1	33.3	30.1	31.7	34.1	37.0	39.5	42.1	42.0	41.1	39.7	38.4	38.6	38.6	37.6	36.6	37.4	37.6
19th	37.1	38.6	37.4	37.1	37.0	35.5	34.4	32.0	31.7	32.8	35.8	38.8	41.4	43.6	45.4	42.1	40.7	39.5	38.4	38.2	37.9	38.1	37.5	36.0
20th	35.6	36.4	36.3	35.9	36.8	35.7	33.7	32.3	32.1	32.2	37.6	42.0	44.6	46.1	44.6	43.5	42.4	40.7	38.2	37.6	37.7	37.6	36.4	36.4
21st	37.6	37.5	37.7	36.6	36.6	35.6	34.1	31.9	30.1	31.3	33.3	36.7	40.6	42.9	42.5	41.6	39.8	39.5	39.1	38.6	38.5	38.0	37.4	37.6
22d	36.4	36.6	36.8	37.0	35.9	34.9	33.3	31.8	30.9	31.6	33.7	37.9	41.6	43.7	44.6	43.2	40.8	39.2	39.1	38.6	37.8	37.6	37.6	36.3
23d	37.1	37.2	37.0	37.0	37.3	36.4	35.9	33.7	33.1	31.1	3.6	36.4	39.6	43.4	45.7	46.3	47.4	46.6	45.6	45.7	41.1	38.1	38.2	37.6
24th	36.0	36.6	33.4	37.3	36.6	34.8	33.6	33.2	30.2	30.3	33.4	36.0	38.4	41.7	43.1	42.6	40.7	40.5	40.1	38.9	38.9	34.5	33.5	32.8
25th	27.7	30.1	29.9	31.6	33.4	31.6	33.1	36.1	37.3	32.2	41.6	41.6	43.8	45.9	41.4	40.7	40.6	40.8	40.2	36.6	33.6	34.2	29.4	34.6
26th	34.9	31.2	32.6	33.8	34.8	35.6	34.3	33.3	—	31.8	32.0	33.6	35.3	36.8	39.4	39.8	40.5	39.9	39.2	38.6	36.3	35.1	32.6	32.2
27th	29.8	31.3	33.9	34.9	33.9	37.5	38.4	33.5	32.9	32.5	34.3	37.0	39.7	42.3	44.4	42.6	41.6	40.8	40.1	39.4	39.7	39.2	37.3	36.9
28th	36.6	36.5	36.7	36.7	36.6	36.4	35.5	34.2	32.1	30.4	29.9	31.1	35.2	37.7	39.7	39.5	38.6	38.5	38.0	37.7	38.4	38.6	38.3	38.1
29th	37.3	35.9	35.1	36.2	36.4	36.6	36.2	33.1	32.2	32.2	34.4	37.5	40.0	42.1	41.8	41.6	39.9	39.1	38.3	38.3	38.8	38.6	38.6	37.8
30th	37.0	36.5	36.6	36.7	36.1	34.9	34.2	33.6	32.9	32.9	35.5	35.7	36.8	38.8	39.7	39.6	38.7	38.9	39.6	39.5	39.4	38.9	40.5	37.7
31st	37.6	34.7	34.6	34.8	34.6	33.2	32.9	32.6	32.4	—	38.3	39.0	41.3	41.9	41.8	41.3	40.4	39.1	38.4	38.8	38.6	38.5	38.8	38.6
Means	35.40	36.20	35.71	35.89	36.04	35.77	35.68	33.83	32.31	31.89	34.17	36.77	39.96	42.19	43.03	42.17	41.12	40.00	38.98	38.28	37.78	36.83	36.24	35.92
Normals	36.48	36.90	36.55	36.62	36.56	36.32	34.90	33.34	31.79	31.34	33.61	36.61	39.65	42.24	43.39	42.03	41.05	39.90	38.92	38.14	37.58	37.26	36.82	36.63

FLAGSTAFF OBSERVATORY.

37

MAGNETIC DECLINATION DURING THE MONTH OF JANUARY 1863.

Value of a part of division = 1.049 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	37.8	37.6	37.2	37.5	38.4	34.8	32.7	31.5	31.0	30.9	33.7	35.6	38.6	40.8	42.4	40.3	41.3	40.4	40.6	39.6	35.6	35.5	37.7	36.3
2d	36.6	33.2	34.4	31.6	33.9	33.4	31.6	31.5	31.3	31.9	35.6	37.8	38.8	41.6	41.5	39.8	39.5	39.5	38.0	38.3	36.6	37.4	38.6	38.5
3d	37.9	40.4	40.7	40.9	36.0	35.1	34.0	34.1	32.4	34.6	36.2	39.3	41.3	41.8	43.4	41.6	40.5	38.7	37.6	36.6	37.9	38.4	38.0	37.4
4th	37.8	36.2	38.4	39.6	38.7	37.6	36.4	33.6	31.0	29.7	36.4	38.6	41.4	43.0	42.4	41.1	40.5	38.4	38.5	38.6	37.6	37.5	37.1	37.8
5th	38.0	35.0	37.1	36.9	38.5	37.2	35.2	32.0	31.9	32.6	35.6	38.3	42.3	43.5	42.1	40.1	38.6	37.6	38.8	39.2	38.8	37.5	35.3	36.2
6th	35.9	35.1	36.6	35.6	35.9	36.3	34.2	33.6	31.9	32.6	34.7	38.5	41.5	42.3	41.6	39.6	37.7	36.6	36.2	39.0	38.0	38.0	35.5	—
7th	37.6	35.9	35.7	36.6	37.4	37.1	35.7	33.1	30.6	32.2	34.8	36.6	41.5	44.5	45.9	44.5	42.6	39.8	38.3	38.1	37.9	37.9	38.1	37.1
8th	36.5	36.7	38.2	38.0	37.5	37.2	35.6	34.1	32.0	30.9	32.7	35.5	40.3	42.8	44.4	40.8	40.1	39.3	38.6	36.0	36.4	36.6	34.4	32.3
9th	34.3	35.4	32.2	35.2	35.1	37.7	35.2	33.3	34.8	34.7	35.7	35.8	41.0	43.0	44.5	44.0	—	40.1	38.8	37.8	38.4	37.9	37.9	37.9
10th	37.1	37.1	37.1	36.1	36.6	34.9	36.5	34.8	30.7	30.0	31.1	35.0	38.2	42.1	41.6	41.1	40.0	40.1	39.8	39.8	38.7	37.7	36.1	34.6
11th	37.1	36.9	37.7	38.6	35.5	34.8	33.9	36.2	35.8	35.6	36.6	40.1	42.6	44.4	45.1	44.6	42.8	41.6	39.6	38.0	36.6	37.3	37.1	34.6
12th	36.2	34.0	38.9	36.1	35.2	34.1	33.3	31.4	30.9	29.2	32.8	34.8	38.5	39.7	42.2	43.0	42.1	41.2	39.5	38.7	37.7	34.3	36.2	32.9
13th	39.8	38.7	40.4	38.0	35.1	36.1	35.2	35.3	35.8	—	34.7	38.2	40.5	42.6	42.8	42.2	42.0	41.6	40.5	38.8	37.0	34.6	35.7	37.7
14th	39.5	37.9	36.6	37.1	36.6	35.6	34.2	31.4	35.6	32.2	33.8	35.8	40.6	44.7	44.6	44.5	41.5	40.6	39.6	36.9	38.6	38.6	37.8	38.6
15th	38.1	37.2	37.5	36.3	36.8	36.6	38.5	36.7	37.3	35.6	37.5	38.6	40.4	41.6	42.3	41.8	41.8	41.1	40.0	36.2	37.6	36.7	38.9	38.5
16th	37.8	37.7	39.6	39.3	36.7	37.5	36.4	34.1	30.6	31.6	33.8	35.6	38.4	40.6	42.6	42.5	41.6	40.7	39.7	39.4	38.1	38.2	38.1	37.7
17th	36.3	35.7	36.3	35.1	38.7	35.1	35.6	33.6	32.8	34.6	34.9	37.2	38.5	40.8	41.6	—	40.7	39.8	39.6	38.8	38.5	39.1	38.4	36.4
18th	37.6	37.8	36.9	37.4	36.8	35.6	34.4	33.3	34.5	35.8	38.0	39.6	41.0	41.7	40.1	40.2	40.0	39.0	39.2	38.7	38.6	39.3	36.7	38.3
19th	37.6	37.1	38.4	36.4	36.8	36.2	34.7	33.3	34.3	35.9	38.8	40.3	40.9	41.0	40.6	40.6	40.0	39.1	38.8	37.5	39.5	39.6	38.6	38.6
20th	38.1	37.6	36.7	36.5	35.8	34.8	32.6	30.7	32.8	34.2	35.6	37.0	39.7	40.9	39.9	38.6	37.4	37.6	37.7	37.8	38.1	38.1	38.6	38.5
21st	38.4	38.4	38.2	37.9	37.4	35.5	33.5	30.2	28.4	41.4	37.0	43.1	47.5	48.5	45.0	42.4	39.8	37.8	36.9	—	37.8	38.4	38.3	38.5
22d	38.4	36.8	38.4	35.1	35.2	33.2	30.6	27.0	26.5	28.8	33.7	37.6	44.0	48.7	49.6	45.7	41.6	39.6	37.6	37.6	37.3	37.5	37.4	37.2
23d	37.4	37.2	36.9	36.3	35.6	35.4	32.7	29.7	—	31.0	33.2	39.4	41.6	43.7	43.4	41.4	39.8	38.6	37.7	38.5	—	39.6	38.6	38.6
24th	38.2	38.4	38.4	38.1	37.5	36.4	32.8	30.4	28.7	31.9	34.0	38.3	43.6	46.8	48.9	46.4	43.2	40.8	38.7	39.4	39.2	34.3	31.7	34.6
25th	37.3	36.8	36.9	36.6	—	40.3	44.1	36.6	45.4	31.9	35.0	35.8	38.6	42.2	43.4	50.2	37.9	37.4	37.3	38.8	40.5	38.9	37.4	32.1
26th	35.6	35.6	36.9	38.4	37.9	32.6	35.6	38.7	31.4	33.6	33.6	34.3	38.6	40.3	43.5	43.6	41.4	39.6	39.6	28.5	30.8	25.7	33.6	33.3
27th	33.4	27.7	28.9	29.6	37.7	36.1	36.6	36.2	30.3	31.6	32.6	34.7	37.6	38.6	40.1	40.1	39.7	39.4	38.4	38.0	38.7	38.4	35.0	32.6
28th	31.2	33.4	37.3	37.6	37.6	37.5	38.5	38.6	35.3	31.8	31.4	32.1	34.0	35.6	39.1	39.7	39.9	39.4	37.6	38.0	37.4	37.6	37.2	37.3
29th	36.6	36.9	37.3	36.6	35.5	34.6	37.4	36.0	31.4	32.1	34.1	36.2	38.4	39.5	—	39.6	40.6	38.4	38.0	37.7	38.0	37.6	37.6	37.5
30th	34.0	31.3	35.4	31.1	33.7	37.4	47.2	35.7	31.6	33.6	34.9	35.0	39.3	41.6	41.7	42.0	41.1	38.8	37.8	36.6	37.0	37.4	36.7	36.6
31st	37.0	35.9	35.7	35.7	37.2	36.7	33.8	31.4	—	32.7	35.8	38.7	43.8	43.7	47.1	42.6	39.6	40.5	37.7	36.6	37.7	34.6	35.6	36.5
Means	36.96	36.30	37.02	36.55	36.60	35.94	35.46	33.51	32.68	32.53	34.80	37.23	40.44	42.36	43.13	42.17	40.53	39.47	38.62	37.80	37.77	37.12	36.92	36.51
Normals	37.28	36.89	37.35	37.03	36.60	35.79	34.75	33.51	32.55	31.66	34.91	37.20	40.29	42.12	42.59	41.70	40.53	39.47	38.62	38.12	38.01	37.50	37.21	37.28

MAGNETIC DECLINATION DURING THE MONTH OF FEBRUARY 1863.

Value of a part of division = 1.049 min.

DAY OF THE MONTH.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	39.4	39.5	35.0	36.4	41.5	37.8	37.6	37.3	36.3	32.2	34.8	37.7	39.5	40.3	42.1	41.1	39.2	37.4	—	36.1	36.5	36.7	36.6	37.0
2d	37.3	36.6	37.6	37.5	37.8	36.4	34.6	32.4	30.3	30.9	33.6	37.8	41.6	43.6	43.6	42.4	40.5	39.6	37.6	36.6	32.6	37.3	36.3	35.6
3d	36.6	36.6	36.9	35.0	37.0	36.8	36.6	34.2	31.8	30.6	33.6	37.0	39.1	41.5	42.6	42.0	40.7	39.0	37.9	37.9	37.4	37.6	36.8	35.6
4th	37.4	37.6	37.6	37.5	38.0	38.7	37.1	34.5	35.4	32.8	33.2	36.5	38.9	41.7	42.7	42.8	42.1	39.7	38.6	37.6	—	37.6	36.9	36.4
5th	37.7	37.6	36.9	37.7	38.2	37.4	36.8	33.7	31.7	30.7	33.0	36.8	40.6	43.3	43.6	42.6	40.7	38.9	37.7	37.2	37.3	36.6	36.7	37.0
6th	36.5	36.6	37.6	38.0	38.4	38.6	36.3	33.5	31.6	30.1	32.1	35.5	39.5	42.4	44.0	44.5	43.5	41.4	39.8	33.9	39.2	37.3	38.4	37.4
7th	36.3	33.6	35.1	33.6	37.3	36.2	34.9	33.0	30.4	29.6	32.1	35.6	39.0	44.1	47.9	48.4	44.5	42.2	41.8	42.0	40.7	39.5	34.6	29.6
8th	36.1	36.2	37.0	37.7	37.0	36.4	33.7	33.9	31.3	31.1	32.6	35.6	38.8	41.6	44.8	43.6	41.8	39.2	39.4	36.5	33.7	33.5	37.1	37.6
9th	37.6	35.9	35.8	38.0	40.3	37.1	35.6	35.4	34.1	33.2	34.8	38.4	38.7	41.8	43.1	42.7	41.5	39.7	33.6	39.2	37.3	34.4	34.3	35.3
10th	32.1	31.7	35.8	38.1	35.7	36.6	35.9	33.5	32.4	32.4	31.7	35.8	39.5	42.5	43.6	43.3	43.5	41.4	39.3	37.9	37.5	35.6	37.7	37.5
11th	37.2	37.2	36.5	37.9	37.6	36.6	35.6	32.9	32.3	31.3	32.2	35.2	37.9	42.3	43.6	42.8	43.8	41.4	39.3	33.8	—	36.8	36.6	34.4
12th	34.5	36.1	36.8	37.2	36.6	36.1	35.9	35.6	33.2	32.3	32.7	37.5	39.4	42.6	44.0	43.7	42.4	41.5	38.3	38.0	38.4	37.4	35.6	37.6
13th	37.4	37.6	36.7	39.8	37.6	35.4	35.4	36.5	35.6	33.4	33.4	34.4	36.7	39.9	41.9	41.7	40.7	39.9	38.9	38.3	38.4	38.1	38.2	37.7
14th	37.6	36.6	35.5	35.4	35.6	35.8	35.5	33.4	31.7	32.2	34.0	36.1	39.6	42.3	43.6	42.3	41.1	39.6	38.7	38.4	38.3	37.7	37.8	37.2
15th	37.5	37.3	37.0	36.6	36.6	35.7	34.8	32.5	32.7	31.6	33.4	36.7	41.5	42.4	42.6	42.0	36.6	39.3	38.2	38.1	37.6	38.6	38.3	37.4
16th	37.5	37.6	37.3	36.9	36.7	36.1	35.8	34.3	30.9	31.3	33.5	39.5	45.7	47.8	46.4	44.4	41.6	39.0	37.1	37.7	38.0	38.6	37.8	37.9
17th	37.5	37.4	37.1	37.4	37.6	36.9	35.3	32.8	31.1	30.1	32.1	36.6	41.6	44.9	44.7	43.5	41.5	39.5	38.3	37.3	33.0	38.2	38.2	37.7
18th	36.9	37.3	37.6	38.6	37.3	36.9	35.6	33.4	31.7	30.5	32.7	37.6	41.6	44.5	45.9	45.7	44.1	41.6	40.3	39.4	39.6	38.6	38.1	34.2
19th	36.6	37.6	38.6	35.6	—	34.7	34.1	32.1	33.4	34.0	34.6	38.6	40.7	45.6	46.7	47.4	44.6	41.1	39.5	36.5	38.3	38.6	38.4	38.1
20th	37.9	37.7	36.9	36.9	36.5	36.4	36.5	34.8	33.9	32.1	32.6	34.8	39.1	42.7	45.5	44.7	42.9	41.1	39.4	38.6	38.5	38.1	34.6	37.6
21st	37.6	37.4	37.5	37.4	37.5	37.0	36.3	34.2	32.2	30.9	31.7	35.6	39.4	42.9	46.4	45.9	43.6	40.8	39.4	38.5	38.0	37.6	37.5	27.3
22d	36.9	37.1	37.0	37.0	37.6	36.9	36.3	35.3	32.3	30.5	30.8	34.2	39.5	42.6	44.9	44.9	42.9	40.9	38.6	37.3	37.6	37.6	36.9	36.4
23d	32.2	31.1	31.7	36.0	37.1	39.2	39.0	39.4	39.6	32.3	33.6	36.1	39.7	41.4	43.8	43.5	42.8	42.3	40.9	37.6	37.7	29.3	37.9	36.6
24th	36.8	36.7	35.4	34.7	36.5	37.0	38.1	34.7	—	32.9	30.8	32.7	35.7	33.3	41.7	43.2	41.5	40.6	39.3	38.6	37.8	38.3	37.6	37.6
25th	35.4	33.9	36.9	39.5	40.2	37.3	35.2	35.2	33.8	32.9	33.8	35.7	36.1	39.6	43.5	42.6	41.1	40.6	39.1	38.6	34.9	33.7	27.6	35.2
26th	31.9	33.6	30.7	30.7	35.8	40.2	38.4	40.6	41.1	36.5	33.8	34.7	38.5	39.9	41.5	42.5	40.7	35.6	38.0	33.0	31.7	31.9	33.7	34.6
27th	35.2	37.6	36.1	33.3	33.6	38.3	33.9	32.5	31.6	30.7	29.2	34.5	35.1	36.9	40.2	39.5	38.7	37.6	33.6	34.6	28.2	36.8	36.4	36.1
28th	35.6	36.1	36.0	35.9	35.7	35.7	35.1	34.8	37.0	34.7	33.9	37.0	38.3	37.8	—	39.5	39.2	38.7	36.9	37.0	36.7	36.6	36.6	36.5
Means	36.42	36.37	36.33	36.67	37.33	36.96	35.95	34.53	33.33	31.94	32.89	36.24	39.35	42.06	43.91	43.35	41.73	40.01	38.72	37.74	37.13	36.76	36.56	36.42
Normals	36.94	36.75	36.72	37.17	37.31	36.96	35.95	34.12	32.43	31.77	33.03	36.37	39.42	42.37	43.89	43.29	41.92	40.17	38.92	37.76	37.95	37.37	36.90	36.67

5. The distance from the forepart of the mirror, attached to the declination magnet, to the scale was measured on several occasions, and was on an average found to be 63.46 in., the telescope and scale being placed to the North of the needle. This, at least, was the case until the registrations were commenced in the Absolute House, when the above distance was 65.88 in. (during July and August, 1862), the relative positions of the needle and telescope remaining the same. At the New Observatory the telescope was placed in the South of the needle, the distance from the mirror to the scale being now 64.56 in. The value of a part of division was frequently determined; namely, on the 8th and 24th of April, and the 9th of July, 1858; on the 5th, 6th, and 7th of January, and the 27th of September, 1859; on the 30th and 31st of May, and the 2nd, 3rd, 4th, 5th, and 6th of June, 1861; and further, on the 30th of August and 1st of September, 1862. From the various sets of observations, the following mean values have been derived for the several periods into which the observations had to be divided on account of unavoidable alterations in the instruments. From the 1st of May, 1858, to the 31st of October, 1860, the ratio of the torsion to the directive power of the needle (η) was = 0.00041, and taking this value into account, the value of a scale division (u) was 0.802 min.; from the 1st of November, 1860, to the 31st of May, 1861, we have, η = 0.00041 and u = 1.071 min.; from the 5th of June, 1861, to the 30th of June, 1862, we have, η = 0.00024 and u = 1.071 min.; from the 1st of July to the 30th of September, 1862, we have, η = 0.00024 and u = 1.027 min.; from the 1st of October, 1862, to the 31st of February, 1863, we have, η = 0.00024 and u = 1.049 min. These various values have been inserted at the head of each table according to the period to which they belong, and it was only through some mistake that for the months of November and December, 1860, the value 0.802, instead of 1.071, was printed. (See page 24.)

Till the 20th of October, 1860, the scale was divided in such a manner that an increase in the reading of the declinometer indicated an increase in Easterly declination; subsequent to that date, the numbering of the scale division runs in the opposite direction, and it was therefore considered advantageous to the purpose to regard all subsequent readings as negative quantities; and by applying to the original readings the corrections presently to be enumerated we obtained values which gave the declination in the same sense as from the beginning. In this way the observations for the various periods became at once comparable with respect to the sense of the numbering of the scale; and therefore *throughout the whole series of the above tables an increase in the readings corresponds to an increase in Easterly magnetic declination.*

For the purpose of determining the zero-point of the scale, monthly observations on the absolute value of the magnetic declination were effected, whereby a means was offered of discovering any change which might have occurred in the declinometer in the course of a month. In consequence of the frequent changes and disturbing causes acting in the vicinity of the Observatory, it would otherwise have been utterly impossible to keep the instruments in check; and if it be advisable, as a general rule, to resort to this means of control, it was in our case of imperative necessity, in order to make the observations made at various times referable to each other. During the first eight months of the working of the Flagstaff Observatory (1st of May to the 24th of December, 1858) the zero-points of the scale of the declinometer remained nearly constant; and the instrument was on the whole so little disturbed during that period, that it was thought advisable to adopt the registrations within it as the standard, to which all subsequent registrations on the magnetic declination should be referred.

Only such corrections as those resulting from the indicated manner of procedure, were applied to the original observations; and in order to enable those especially interested in the subject to derive again the original readings from our tables, we subjoin an exact and complete catalogue of these corrections.

Corrections applied to the Original Readings of the Declinometer, in scale divisions, by which the Monthly Tables on the Magnetic Declination were obtained

1858. May 1st to Dec. 24th, 7^h p.m., cor. = 0.0; Dec. 24th, 8^h p.m., to Feb. 7th (1859) 11^h p.m., cor. = - 5.2.

1859. Feb. 8th, cor. = - 4.0; Feb. 9th, cor. = - 2.9; Feb. 10th, cor. = - 1.8 (the three latter caused by removal of the iron house); Feb. 11th to April 30th, 11^h p.m., cor. = - 0.6; May 1st to June 30th, cor. = + 3.3; July 1st, midn., to July 20th, 3^h p.m., cor. = + 17.0; July 20th, 5^h p.m., to Sept. 29th, 6^h a.m., cor. = + 1.1; Sept. 29th, 2^h p.m., to Oct. 29th (1860), 8^h a.m., cor. = - 8.8.

1860. Oct. 19th, 5^h p.m. [new scales, the numbering in a reversed order; for this reason all registrations regarded as negative quantities], cor. = + 115.0.

The value of the scale divisions having also been changed, it was necessary to reduce all registrations subsequent to the 19th of October to the same scale divisions as used from the beginning of the month to the above date, in order that all readings of the declinometer in scale divisions during this month might correspond to the value of a part of division, 0.802 min. The correction = + 115.0 pt. of div. remains the same till the end of May, 1861.

1861. June 4th, 3^h p.m., to Jan. 16th (1862), 11^h p.m., cor. = + 99.0.

1862. Jan. 17th, midn., to Jan. 31st, 11^h p.m., cor. = + 114.1; Feb. 1st, midn., to Feb. 6th, 2^h p.m., cor. = + 115.1; Feb. 6th, 3^h p.m., to the end of the month of June, cor. = + 98.5; July 1st, midn., to July 10th, 1^h p.m., cor. = + 98.5 [the readings from the 1st to the 10th were reduced to the same scale divisions as those from the 10th to the 31st of July, viz. 1.027 min.]; July 10th, 5^h p.m., to September 20th, cor. = + 98.1; Sept 21st [New Observatory; all readings subsequent to this date reduced to the same scale divisions as those from the beginning of the month to the 20th, viz. 1.027 min.], to the end of February, cor. = + 113.6.

In the tables of the magnetic declination, as given above, only such missing hours as were apparently quite free from any disturbance, were interpolated. The values thus obtained are enclosed within brackets, and in taking the hourly means for each month they have been included.

During the months of May and June, 1859, the declinometer seems not to have been in perfect order, for reasons which I have already explained in the Introduction; it was therefore found impracticable to derive also the Normals for these two months. The registrations made during the latter end of the month of July, 1862, could not be made use of, inasmuch as the water had got under the Horary House and round the piers, thereby causing the instrument to become deranged; and as it was only on the 22nd of this month that I returned from a trip made in connexion with the Magnetic Survey this could not conveniently be remedied previously. With a view to separate the disturbed observations, I had to fix upon a limit of disturbance; and here I was particularly guided by the precedents established by other writers on this subject; for, although quite aware that such a limit must depend, to a great extent,

When treating of the absolute declination, we shall have again to refer to the above quantities. Suffice it for the present to say that they have to be increased by 2.94 min., in order to obtain the zero-points of the scale as they were originally derived from the observations, this reduction being necessary, on account of some iron in the case of the apparatus, for the absolute measurement of the magnetic declination.

The corrections above given had been determined previously to the complete reduction of the absolute measurements of the magnetic declination, and had for this reason to be considered as being only preliminary.

When all the absolute observations had been reduced, and the hourly tables and monthly means thereof had been made ready and carefully examined, it became evident that, for the complete reduction of the observations to the standard period, from the 1st of May to the 31st of December, 1858, a slight amount was still wanting. This deficiency must be attributed partly to a change in the torsion of the thread of suspension and partly to changes in the position of the pier whereupon the declinometer was mounted, and which had not as yet been brought into account. It was by the aid of an exact level fixed on the pier, and frequently read, that we arrived at the latter conclusion. The amounts ascertained are to be distributed over the whole period of observations in the following manner:— For the period from the 1st of January, 1859, to the end of December, 1861, a correction of + 3.30 min. is to be applied; for the period from the 1st of February to the 31st of June, 1862, a correction of + 4.00 min.; and for the period from the 1st of October, 1862, to the 28th of February, 1863, a correction of 1.94 min. Carrying this into execution for the monthly means of the Final Normals, we obtain the following table:

CORRECTED MONTHLY MEANS OF THE FINAL NORMALS IN THE MAGNETIC DECLINATION.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1858	—	—	—	—	35.80	37.04	37.82	38.67	38.46	36.79	36.48	37.51
1859	39.61	41.05	41.58	38.69	37.48	36.28	35.07	34.57	35.75	37.47	37.47	38.04
1860	38.52	39.82	39.61	39.42	38.21	38.15	37.75	37.39	36.38	36.87	36.28	37.16
1861	38.10	38.17	38.23	37.31	35.39	35.44	37.53	37.94	38.63	38.78	38.51	38.50
1862	(38.69)	38.88	39.36	38.53	38.05	39.68	39.79	39.90	40.00	40.11	40.30	41.28
1863	41.45	41.57	—	—	—	—	—	—	—	—	—	—

This table exhibits now in a satisfactory manner the monthly means of the Final Normals, reduced to the standard period above delineated.

7. Solar Diurnal Variation of the Magnetic Declination. In order to obtain the solar diurnal variation in this magnetic element, the minimum values of the means and final normals for every month were subtracted from every mean and final normal for that month; the differences thus obtained being multiplied by the respective value of a scale division. In this way we have constructed the following tables, four in number, adopting a semi-annual division of the year ("Sun's declination North," from April to September, and "Sun's declination South," from October to March), and keeping the means derived from *all observations* separate from those derived from the *Normals* (larger disturbances eliminated).

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION. ALL OBSERVATIONS.

(MONTHS FROM APRIL TO SEPTEMBER.)

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May	0.92	1.10	1.47	1.87	2.77	1.53	1.58	1.61	1.05	0.27	0.00	0.73
" June	0.20	0.54	1.10	1.53	2.05	1.82	1.86	2.31	2.70	1.76	0.95	0.57
" July	0.00	0.08	0.71	1.43	1.77	2.23	2.32	2.36	2.29	2.00	0.71	0.08
" August	2.07	2.45	2.88	3.26	3.45	3.55	3.30	3.51	3.07	1.32	0.26	0.00
" September	4.57	5.42	5.82	5.64	6.11	5.83	5.99	5.07	3.15	0.85	0.00	1.13
1859 April	1.85	1.51	1.95	2.20	2.35	3.01	2.51	1.82	0.57	0.00	1.00	3.43
" May	0.94	0.84	0.89	1.37	0.92	1.05	1.03	0.81	0.29	0.00	1.06	2.60
" June	1.29	1.18	1.37	1.35	1.68	1.31	1.30	1.18	0.75	0.20	0.00	0.84
" July	1.31	1.07	1.53	1.67	1.85	1.89	1.88	1.68	0.83	0.00	0.59	2.46
" August	2.34	2.04	2.35	2.63	2.88	2.82	2.64	2.47	1.33	0.00	0.39	2.41
" September	1.45	0.82	1.45	1.48	2.23	2.15	2.32	0.94	0.00	0.29	1.26	3.98
1860 April	2.92	3.73	3.45	3.45	3.73	3.70	3.89	2.71	1.20	0.02	0.00	1.89
" May	1.94	1.78	2.39	2.67	2.75	3.42	2.82	2.96	2.12	0.88	0.00	0.65
" June	1.47	1.88	2.11	2.35	2.37	2.39	2.37	2.52	2.41	1.45	0.12	0.00
" July	1.69	2.35	2.60	3.40	3.53	3.35	3.38	2.84	2.41	0.94	0.00	0.47
" August	2.22	3.59	3.01	3.19	4.48	5.38	5.07	4.75	3.62	2.15	0.00	1.01
" September	3.99	4.23	4.48	4.72	5.39	4.58	4.15	2.97	1.83	0.05	0.00	1.62
1861 April	1.90	2.38	2.63	2.28	2.11	2.37	2.12	0.69	0.01	0.00	1.03	3.63
" May	0.19	0.82	0.98	0.98	0.99	1.04	1.32	0.77	0.09	0.00	0.75	2.28
" June	0.09	0.38	1.05	1.23	1.71	1.55	1.86	1.67	1.48	0.41	0.01	0.19
" July	1.27	1.45	1.87	2.34	2.72	2.46	2.48	2.43	2.62	1.12	0.00	0.77
" August	0.53	0.39	1.18	1.64	1.65	2.44	2.33	2.78	2.57	1.67	0.42	0.00
" September	2.58	2.72	3.27	3.68	4.05	3.99	4.00	3.71	2.27	0.63	0.00	1.07
1862 April	2.60	2.81	3.19	3.50	3.37	3.44	3.21	2.66	1.08	0.00	0.17	2.08
" May	1.41	1.88	2.44	2.81	3.07	2.95	2.85	2.59	2.42	0.64	0.00	0.73
" June	0.63	0.65	1.25	1.45	2.29	2.02	2.30	2.31	2.47	1.37	0.74	0.00
" July	1.77	2.02	3.31	3.11	3.22	3.66	3.72	3.33	2.74	1.82	0.00	1.96
" August	2.17	2.95	3.21	4.27	4.70	4.48	5.24	4.45	3.15	0.69	0.00	1.23
" September	3.64	4.19	4.44	4.65	5.53	5.31	5.50	3.71	1.43	0.00	0.55	3.12

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May	2.22	3.95	4.83	4.97	4.02	2.52	2.15	1.80	1.34	1.23	0.81	0.97
" June	1.52	2.66	3.81	4.48	4.15	1.91	1.86	1.73	0.75	0.00	0.47	0.37
" July	0.54	1.90	3.15	4.23	3.76	2.69	2.10	1.69	1.02	0.72	0.18	0.33
" August	0.92	2.77	4.60	5.28	5.16	3.95	2.98	3.20	2.44	2.38	2.17	2.19
" September	3.72	6.76	8.56	8.76	7.99	6.58	5.72	5.48	4.95	4.64	4.69	4.75
1859 April	6.34	7.99	8.75	8.24	6.93	5.57	4.52	3.74	2.97	2.85	2.39	2.21
" May	4.23	5.76	6.35	6.26	5.33	4.04	2.71	1.92	1.44	1.03	3.51	0.55
" June	2.55	4.77	6.01	6.26	5.41	3.95	3.55	2.94	2.37	1.43	1.06	0.71
" July	5.40	7.44	8.90	9.05	8.00	6.22	5.59	4.26	3.34	2.75	1.54	1.16
" August	5.33	8.90	10.35	11.47	10.47	8.32	7.15	6.32	4.64	3.71	2.96	2.51
" September	7.22	9.77	11.33	11.35	10.15	8.20	5.32	4.35	3.73	1.47	2.06	1.51
1860 April	4.68	7.96	9.90	9.60	8.41	6.02	5.88	5.18	3.81	2.84	2.90	2.73
" May	2.75	4.79	6.82	7.60	7.13	5.49	4.79	4.11	3.55	2.79	2.06	1.64
" June	1.53	3.08	4.94	5.83	5.55	3.84	3.55	3.23	2.56	1.93	1.59	1.41
" July	2.45	4.75	6.59	7.31	6.42	4.83	4.24	3.79	2.25	2.32	1.33	0.98
" August	2.33	4.81	7.49	8.76	8.62	6.87	5.59	4.50	4.19	3.88	3.08	1.99
" September	4.49	7.21	9.60	10.15	9.10	7.85	6.00	4.85	4.53	4.24	3.56	3.63
1861 April	6.66	9.12	10.57	9.92	8.19	6.19	5.33	4.22	3.36	2.91	2.59	2.89
" May	4.48	6.38	7.61	7.58	6.66	4.84	3.08	2.60	1.90	1.27	0.60	0.36
" June	1.38	2.55	3.88	4.43	3.66	2.20	1.81	1.56	1.06	0.51	0.24	0.00
" July	0.97	3.04	5.11	6.14	5.23	3.42	3.00	2.71	2.42	1.48	1.12	1.22
" August	0.91	3.03	5.03	5.98	6.07	4.83	3.20	3.08	2.31	1.70	1.74	0.30
" September	3.54	6.46	8.69	9.40	8.14	6.63	5.13	4.57	3.92	3.06	3.84	2.73
1862 April	4.98	7.46	8.18	8.12	6.97	5.43	4.53	3.40	2.97	1.99	2.35	2.37
" May	2.29	4.37	6.24	6.68	5.75	4.35	3.28	2.51	1.69	1.53	1.37	1.72
" June	0.55	2.29	3.07	4.35	4.49	3.05	2.59	2.13	2.07	1.51	1.00	0.69
" July	3.63	5.44	6.85	7.09	6.52	5.09	4.36	3.37	2.16	1.62	1.87	1.27
" August	2.73	5.84	7.16	7.47	7.09	5.65	4.58	3.25	2.95	2.61	1.57	1.11
" September	5.83	8.17	9.23	8.27	7.26	5.21	4.59	3.55	3.22	2.50	2.86	2.37

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION. ALL OBSERVATIONS.

(MONTHS FROM OCTOBER TO MARCH.)

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October	5.75	5.82	6.13	6.48	6.59	6.36	5.67	3.41	1.31	0.00	1.74	5.56
" November	5.27	5.54	5.75	5.85	6.08	5.21	3.92	1.63	0.00	0.00	2.27	6.35
" December	6.23	6.44	6.61	6.52	6.76	6.15	4.80	1.95	0.06	0.00	1.98	5.46
1859 January	7.05	7.00	6.94	6.99	7.10	6.56	5.40	3.31	0.98	0.00	1.98	5.01
" February	6.44	6.20	5.97	6.69	7.04	7.05	5.62	3.40	1.27	0.00	1.65	5.68
" March	3.29	2.92	2.82	3.29	3.29	3.15	3.07	1.83	0.56	0.00	1.30	3.63
" October	4.93	5.23	4.78	5.10	5.86	5.59	5.31	3.23	1.20	0.00	1.30	5.02
" November	6.26	6.79	6.99	7.39	7.69	6.21	4.11	1.81	0.06	0.00	2.51	6.27
" December	7.04	7.55	7.90	7.88	7.34	6.19	4.05	1.11	0.00	0.44	4.27	8.04
1860 January	6.72	6.57	6.23	6.09	6.12	5.42	4.36	1.98	0.00	0.19	2.71	6.64
" February	6.03	6.01	5.77	5.50	5.79	6.00	4.11	1.40	0.02	0.00	2.75	6.95
" March	1.86	4.78	5.55	4.90	4.71	4.80	4.44	2.75	0.72	0.00	1.71	5.50
" October	6.00	6.50	6.47	6.75	6.77	6.62	5.88	3.54	1.39	0.00	1.25	4.93
" November	5.65	6.05	6.24	6.63	6.78	6.48	5.17	2.64	0.90	0.00	1.05	4.65
" December	6.30	6.28	6.75	6.84	6.83	5.77	4.32	2.11	0.22	0.00	1.84	5.01
1861 January	6.31	6.56	6.58	4.91	6.96	5.84	4.56	1.95	0.00	0.17	2.27	6.09
" February	4.87	4.61	4.59	4.43	4.92	4.86	3.55	1.75	0.75	0.00	1.41	4.56
" March	5.00	4.66	4.94	4.96	5.24	5.34	5.36	3.20	0.96	0.00	1.41	4.80
" October	4.32	4.80	5.29	5.09	5.30	5.37	4.46	2.54	0.80	0.00	0.70	3.41
" November	5.20	5.41	5.38	5.58	5.89	5.22	3.90	2.05	0.14	0.00	1.80	5.29
" December	5.75	5.64	6.22	5.85	6.08	4.85	2.75	1.10	0.61	0.00	2.45	6.27
1862 February	6.10	5.46	5.59	5.82	6.42	6.07	4.67	2.70	1.47	0.00	1.50	4.82
" March	4.04	4.23	4.33	4.39	4.44	4.64	4.21	2.83	1.06	0.00	1.11	4.37
" October	2.50	3.45	3.46	3.69	4.99	4.68	3.78	2.10	0.95	0.00	1.54	4.48
" November	3.78	3.90	3.64	4.85	5.22	4.21	3.46	1.44	0.07	0.00	2.08	5.39
" December	3.68	4.52	4.01	4.20	4.35	4.07	3.98	2.04	0.44	0.00	2.39	5.12
1863 January	4.65	3.95	4.71	4.22	4.27	3.58	3.07	1.03	0.16	0.00	2.38	4.93
" February	4.70	4.65	4.61	4.96	5.65	5.27	4.21	2.72	1.46	0.00	1.00	4.51

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October	9.51	12.23	13.44	13.01	10.73	8.96	7.37	7.09	6.76	6.70	5.56	5.55
" November	0.84	12.46	13.14	11.98	10.18	8.54	7.28	6.93	7.09	6.75	6.41	5.59
" December	8.85	11.45	11.83	11.26	10.02	8.85	8.22	7.98	7.61	7.23	7.05	6.60
1859 January	8.28	11.61	12.25	11.39	10.40	9.20	8.51	8.43	8.20	7.93	7.36	7.71
" February	9.63	12.81	14.36	13.86	12.16	10.13	8.42	7.86	8.03	7.58	6.98	6.16
" March	6.68	8.91	10.09	9.64	8.14	6.46	5.40	5.00	4.60	4.38	2.94	3.80
" October	9.68	13.26	14.68	14.15	11.99	9.89	7.86	7.20	6.65	6.08	5.77	6.14
" November	10.39	13.89	15.39	14.18	12.37	10.01	8.44	7.94	8.03	7.73	6.84	6.65
" December	12.41	15.86	17.09	16.21	14.25	11.58	9.57	8.57	8.32	7.77	7.16	7.55
1860 January	10.45	13.64	14.78	14.05	12.18	10.50	9.06	8.64	8.33	8.24	7.05	7.07
" February	10.65	13.77	15.42	14.96	12.94	10.54	8.36	7.39	7.19	6.62	6.40	6.16
" March	9.47	12.27	13.49	12.94	11.01	8.66	6.85	6.54	5.93	4.83	4.43	4.41
" October	8.82	11.94	13.79	13.43	11.73	9.32	7.96	7.58	7.29	6.44	6.50	5.82
" November	8.47	11.06	13.45	13.36	11.56	9.56	8.15	7.20	7.00	6.72	6.42	3.70
" December	8.04	10.85	12.44	12.29	11.54	9.19	8.04	7.10	7.01	7.00	6.62	6.43
1861 January	9.65	12.52	14.18	13.82	12.58	10.69	9.08	7.93	7.82	7.14	6.65	6.67
" February	7.92	10.53	12.64	12.85	11.09	9.68	7.60	6.54	5.87	5.55	4.79	4.38
" March	9.01	12.50	14.20	14.06	12.00	9.34	7.60	7.36	6.42	6.18	5.40	4.94
" October	6.59	9.72	11.49	11.40	10.00	8.28	6.63	6.49	5.74	5.36	4.34	4.07
" November	9.08	11.72	13.23	12.22	10.51	9.00	7.19	6.71	7.14	6.33	5.16	4.96
" December	9.86	12.22	13.46	12.53	10.63	8.71	7.62	7.04	6.72	6.63	5.87	6.26
1862 February	7.89	11.16	12.76	13.02	11.05	9.35	8.15	7.37	7.07	6.59	6.04	6.13
" March	7.75	9.84	10.88	10.50	8.84	7.35	6.35	5.44	4.89	4.79	4.51	3.37
" October	7.76	10.26	11.31	10.78	8.65	7.30	6.26	4.45	4.10	2.78	2.77	2.76
" November	8.86	11.04	11.84	11.19	9.44	7.71	6.25	5.91	5.37	4.58	4.46	3.95
" December	8.47	10.80	11.69	10.78	9.68	8.51	7.44	6.70	6.18	5.18	4.56	4.23
1863 January	8.30	10.32	11.12	10.11	8.39	7.28	6.39	5.53	5.50	4.81	4.61	4.18
" February	7.77	10.62	12.56	11.97	10.27	8.47	7.11	6.08	5.44	5.06	4.85	4.70

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION.
LARGER DISTURBANCES ELIMINATED.

(MONTHS FROM APRIL TO SEPTEMBER.)

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May ...	1.04	1.37	1.47	1.87	2.77	1.53	1.58	1.48	1.05	0.15	0.00	0.74
" June ...	0.10	0.32	0.89	1.32	1.68	1.45	1.48	1.56	2.08	0.94	0.23	0.10
" July ...	0.42	0.60	0.84	1.58	1.68	1.72	1.30	1.96	1.85	1.54	0.41	0.00
" August ...	2.21	2.28	2.93	3.26	3.15	3.56	3.30	3.36	3.07	1.49	0.36	0.00
" September ...	5.04	5.53	6.19	6.22	6.32	6.16	6.05	5.07	3.33	1.03	0.00	1.13
1859 April ...	1.84	2.01	1.92	2.83	2.81	2.62	2.50	1.49	0.39	0.00	1.00	3.47
" July ...	1.84	0.47	2.34	1.63	1.60	1.62	1.52	1.48	1.14	0.00	0.10	1.71
" August ...	1.67	1.60	1.78	2.10	2.26	2.78	3.10	2.56	1.19	0.00	0.75	3.89
" September ...	1.22	1.24	1.41	1.30	2.15	1.78	2.46	1.92	1.59	0.00	1.43	3.80
1860 April ...	3.64	3.37	3.85	3.97	3.75	4.02	4.00	2.99	1.01	0.13	0.00	2.17
" May ...	1.94	2.57	2.84	2.82	3.91	3.26	2.78	2.96	2.25	0.88	0.00	0.65
" June ...	1.59	1.70	2.07	2.31	2.34	2.35	2.34	2.49	2.23	1.42	0.09	0.00
" July ...	2.05	2.70	3.21	3.76	3.73	3.70	3.29	3.06	2.77	1.29	0.00	0.65
" August ...	2.60	2.98	3.14	3.71	3.82	3.78	3.70	3.53	2.67	0.97	0.00	0.07
" September ...	4.21	4.46	4.65	4.84	4.81	4.75	4.52	3.14	1.48	0.22	0.00	1.66
1861 April ...	2.98	3.35	3.41	3.01	3.30	3.07	2.86	1.38	0.33	0.00	1.57	4.17
" May ...	0.21	0.93	0.66	0.16	0.40	1.20	1.56	0.03	0.00	0.09	0.42	1.95
" June ...	0.36	0.56	1.17	1.18	1.60	1.50	2.09	2.14	1.51	0.66	0.00	0.11
" July ...	1.40	1.66	1.85	2.34	2.60	2.46	2.48	2.43	2.62	0.98	0.00	0.77
" August ...	1.55	1.35	1.90	2.43	2.14	2.45	2.15	2.62	2.42	1.44	0.43	0.00
" September ...	2.77	3.09	3.61	3.83	4.05	3.99	4.15	3.72	1.99	0.13	0.00	1.07
1862 April ...	2.97	3.42	3.46	3.70	3.52	3.55	3.34	2.60	1.04	0.00	0.29	2.20
" May ...	1.69	2.08	2.45	2.87	3.02	2.95	2.72	2.60	1.99	0.64	0.00	0.73
" June ...	0.94	1.17	1.87	1.88	2.32	2.18	2.02	2.01	1.96	0.76	0.00	0.16
" August ...	0.87	1.11	2.29	3.26	5.24	3.98	4.59	4.08	2.54	0.28	1.10	1.70
" September ...	3.18	3.85	3.35	5.29	5.89	5.35	5.35	3.35	0.85	0.00	0.34	2.50

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May ...	2.23	3.64	4.76	4.85	4.02	2.71	2.16	1.97	1.64	1.38	0.94	0.98
" June ...	1.01	2.28	3.25	3.69	3.48	1.50	1.23	1.53	0.72	0.14	0.10	0.00
" July ...	0.45	1.82	3.07	4.15	3.68	2.22	1.61	1.73	0.97	0.96	0.46	0.25
" August ...	0.93	2.62	4.60	5.12	5.04	3.96	3.10	3.06	2.64	2.52	2.47	2.21
" September ...	3.90	6.79	8.42	8.53	7.98	6.62	5.65	5.61	5.44	5.00	5.27	4.94
1859 April ...	5.58	7.70	8.42	8.10	6.46	5.43	4.77	3.89	3.53	2.82	2.69	2.40
" July ...	4.77	6.69	8.36	7.69	7.22	5.73	4.90	3.55	3.12	2.30	1.58	0.95
" August ...	6.59	9.08	10.76	11.50	10.86	8.16	6.77	6.17	4.27	3.48	2.60	2.51
" September ...	7.62	10.31	12.91	12.44	10.82	8.11	5.39	4.53	4.13	2.49	3.03	1.86
1860 April ...	5.13	8.23	9.90	9.88	8.41	6.30	6.28	5.29	4.56	3.12	3.49	3.10
" May ...	2.75	4.92	6.69	7.60	6.99	5.49	4.48	3.97	3.55	2.79	2.08	2.27
" June ...	1.50	3.19	4.91	5.80	5.51	3.81	3.37	3.19	2.53	1.90	1.70	1.66
" July ...	2.64	5.11	6.82	7.66	6.78	4.95	4.60	4.00	3.34	3.07	2.28	1.92
" August ...	1.52	3.88	6.69	7.83	7.79	5.84	4.95	4.23	3.71	3.57	3.05	3.12
" September ...	4.52	7.24	9.41	9.86	8.74	7.17	7.64	5.20	5.13	4.58	4.60	4.24
1861 April ...	7.53	9.51	10.48	10.12	8.74	7.00	6.49	5.80	5.41	4.23	3.60	5.55
" May ...	4.15	6.20	7.49	7.67	6.93	4.87	3.12	2.74	2.10	1.59	0.82	0.27
" June ...	1.33	2.66	4.05	4.96	4.33	2.62	1.76	1.65	1.00	0.75	0.47	0.46
" July ...	0.97	3.04	5.11	6.14	5.23	3.28	2.82	2.71	2.42	1.62	1.43	1.22
" August ...	0.90	3.22	5.06	6.17	6.26	5.02	3.07	3.18	2.79	2.44	1.45	1.39
" September ...	3.54	6.46	8.57	9.24	7.22	6.63	5.32	4.57	4.22	3.65	3.46	2.99
1862 April ...	5.11	7.96	8.31	8.02	6.59	5.21	4.66	3.84	3.45	3.15	2.94	2.92
" May ...	2.30	4.38	6.13	6.70	5.76	4.36	3.28	2.51	2.01	1.52	1.41	1.73
" June ...	1.05	3.08	4.12	4.86	4.62	2.79	2.17	2.28	2.12	1.56	0.91	0.85
" August ...	3.12	6.41	7.63	7.16	6.50	5.73	4.71	2.14	3.39	2.08	1.14	0.00
" September ...	5.16	7.52	8.41	6.27	6.61	4.86	4.34	2.06	2.40	1.96	1.82	2.47

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION
LARGER DISTURBANCES ELIMINATED.

(MONTHS FROM OCTOBER TO MARCH.)

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ...	6.01	6.16	6.26	6.74	6.71	6.34	5.46	3.41	1.24	0.00	1.93	5.49
" November ...	5.53	5.51	6.02	6.13	5.99	5.07	3.63	1.41	0.00	0.04	2.54	6.35
" December ...	5.32	5.49	5.64	5.28	5.44	4.82	3.54	1.47	0.27	0.00	1.18	5.55
1859 January ...	6.16	6.58	6.68	7.65	6.96	6.16	5.06	2.73	1.10	0.00	2.52	5.14
" February ...	6.58	6.47	6.48	7.24	7.09	6.86	5.58	1.27	1.15	0.00	1.19	5.08
" March ...	3.93	3.51	3.33	3.27	3.47	3.32	3.08	1.85	0.72	0.00	1.39	3.65
" October ...	6.47	7.00	6.60	6.72	6.84	6.13	5.51	3.02	0.96	0.00	1.42	5.39
" November ...	6.92	7.32	7.42	7.39	7.69	6.20	4.15	1.78	0.19	0.00	2.36	6.58
" December ...	7.72	8.02	8.19	8.33	8.16	6.67	4.62	1.93	0.00	0.38	4.16	8.35
1860 January ...	7.20	6.60	6.48	5.97	6.24	5.32	4.39	1.85	0.00	0.06	2.71	6.13
" February ...	6.43	6.40	6.12	6.32	6.16	5.93	4.26	1.67	0.00	0.00	3.37	7.44
" March ...	5.41	5.51	5.80	5.48	5.60	5.07	4.51	2.64	0.63	0.00	2.19	6.08
" October ...	6.36	6.82	6.80	7.09	7.10	6.94	6.19	3.55	1.28	0.00	1.45	5.31
" November ...	5.98	6.22	6.60	6.80	7.15	6.47	4.79	2.45	0.72	0.00	0.70	3.75
" December ...	5.97	5.82	6.29	6.23	6.37	5.31	3.72	1.58	0.00	0.32	1.92	5.20
1861 January ...	7.64	7.33	7.23	5.42	7.03	6.57	4.76	2.16	0.00	0.25	2.91	6.82
" February ...	4.87	4.75	4.77	4.43	5.07	4.57	3.55	1.75	0.41	0.00	1.12	4.26
" March ...	5.85	5.49	6.20	6.70	5.92	6.22	5.82	3.32	1.09	0.00	2.04	5.45
" October ...	4.99	5.25	5.53	5.55	5.67	5.50	4.44	2.70	0.77	0.00	0.68	3.39
" November ...	5.77	6.32	6.22	6.55	6.00	5.55	3.85	2.05	0.48	0.00	1.97	5.60
" December ...	6.28	6.46	6.58	6.04	5.65	5.13	2.90	1.13	0.29	0.00	2.45	5.89
1862 February ...	5.51	6.02	5.39	5.78	6.10	6.17	5.07	2.73	0.97	0.00	1.72	4.70
" March ...	4.43	4.69	4.59	4.53	4.71	4.77	4.34	2.81	0.99	0.00	1.24	4.51
" October ...	4.27	4.55	0.01	5.02	5.44	5.14	3.62	2.16	0.53	0.00	1.68	4.70
" November ...	4.42	4.50	4.41	5.73	5.58	4.55	3.08	1.64	0.11	0.00	1.97	5.31
" December ...	5.39	5.83	5.46	5.54	5.48	5.22	5.45	2.10	0.47	0.00	2.37	5.53
1863 January ...	5.90	5.48	5.97	5.64	5.19	4.33	3.24	1.94	0.93	0.00	3.41	5.81
" February ...	5.42	5.22	5.19	5.66	5.80	5.44	4.39	2.48	0.69	0.00	1.32	4.83

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ...	10.35	12.21	13.57	13.26	10.86	9.09	7.66	7.46	7.22	6.83	6.53	5.68
" November ...	10.23	12.73	13.28	12.11	10.32	8.68	7.39	7.10	7.14	6.69	6.52	5.75
" December ...	9.00	10.78	12.28	11.61	10.14	8.36	7.26	7.02	7.13	6.96	6.97	6.05
1859 January ...	8.85	11.85	12.09	10.94	10.27	8.48	8.24	7.72	7.59	7.77	6.36	7.03
" February ...	9.13	12.01	13.89	13.05	11.54	9.97	8.43	8.26	8.06	7.54	6.71	6.03
" March ...	7.02	9.20	10.24	9.65	8.13	6.31	5.41	5.40	5.03	4.54	3.03	3.73
" October ...	10.04	13.76	15.07	14.23	12.10	9.92	8.41	7.87	7.17	7.15	6.95	6.68
" November ...	10.58	13.92	15.39	14.19	12.38	10.03	8.44	7.95	8.30	7.73	7.27	7.29
" December ...	12.72	16.01	17.51	16.38	14.55	11.88	9.87	9.20	9.10	8.78	8.33	7.98
1860 January ...	11.06	13.98	15.03	13.72	12.03	10.06	8.90	8.35	8.17	8.08	7.48	7.07
" February ...	11.21	14.18	15.54	15.38	13.20	10.78	8.60	7.80	7.43	7.28	7.32	6.94
" March ...	10.27	13.17	14.26	13.50	11.10	9.11	7.38	7.05	6.91	6.36	5.81	5.64
" October ...	8.68	11.93	13.90	13.77	11.91	9.50	8.14	7.76	7.47	7.27	6.68	6.36
" November ...	7.57	10.59	12.43	13.34	11.71	9.55	8.14	7.19	6.99	6.89	6.41	5.81
" December ...	7.54	10.25	12.29	12.46	12.65	9.36	7.69	7.06	6.82	6.40	6.35	6.10
1861 January ...	9.34	12.26	14.18	14.28	12.79	11.31	9.64	8.80	8.90	8.17	8.06	7.55
" February ...	7.92	10.67	12.66	13.02	11.77	9.68	7.60	6.70	5.87	6.12	5.38	5.34
" March ...	9.32	12.83	14.82	14.55	12.33	9.67	7.93	7.70	7.35	6.66	6.20	5.60
" October ...	6.57	9.70	11.47	11.71	9.98	8.26	6.44	6.34	5.72	5.34	5.18	4.06
" November ...	9.39	12.21	13.30	12.52	10.68	9.17	7.55	7.04	6.69	6.63	6.11	5.28
" December ...	9.59	12.09	13.46	12.40	10.50	8.71	7.62	7.04	6.89	6.63	6.77	6.26
1862 February ...	7.54	10.85	12.85	12.61	10.92	8.96	8.28	6.95	6.87	6.55	6.21	6.17
" March ...	7.88	9.89	11.03	11.46	8.75	7.22	6.31	5.73	5.39	5.06	5.13	4.82
" October ...	7.97	10.96	11.78	11.01	8.86	7.54	6.25	5.18	5.06	4.87	3.90	4.20
" November ...	9.20	11.24	12.04	11.39	9.64	8.05	6.66	6.27	6.12	5.34	5.16	4.45
" December ...	8.72	11.43	12.63	11.21	10.18	8.98	7.95	7.13	6.54	6.21	5.75	5.55
1863 January ...	9.06	10.97	11.46	10.53	9.31	8.20	7.30	6.78	6.66	6.12	5.82	5.90
" February ...	8.03	11.11	12.71	12.08	10.64	8.81	7.50	6.28	6.48	5.87	5.38	5.13

The values of these tables have been combined into general means for the whole period of observation, in order to obtain Solar Diurnal Variation Tables, for every month, for the months from April to September and from October to March, and for the year. The mean values thus obtained have been again referred to the minimum in each of the respective periods to which they belong, whereby the minimum is made to be zero, and the values for the other hours are simply the differences with respect to the minimum.

The subjoined table contains the result of this proceeding with respect to all observations, the disturbances being included; and on Table 19 we have the results thrown into curves.

MEAN SOLAR DIURNAL VARIATIONS IN THE MAGNETIC DECLINATION.

(DERIVED FROM ALL OBSERVATIONS.)

HOUR.	DURING THE YEARS 1858 TO 1863.														
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Summ.	Winter	Year.
Midnight.	6.09	5.63	3.55	2.32	0.72	0.42	0.95	1.66	2.89	4.70	5.23	5.71	5.15	1.39	3.10
1h	5.93	5.39	4.15	2.61	0.92	0.61	1.13	2.07	3.12	5.16	5.54	6.00	5.36	1.64	3.33
2h	6.02	5.31	4.41	2.80	1.27	1.06	1.74	2.32	3.53	5.23	5.60	6.21	5.46	2.02	3.57
3h	5.46	5.48	4.38	2.86	1.58	1.26	2.13	2.79	3.67	5.42	6.06	6.17	5.49	2.28	3.72
4h	6.02	5.96	4.42	2.89	1.74	1.70	2.36	3.22	4.30	5.90	6.33	6.18	5.80	2.60	4.03
5h	5.26	5.85	4.48	3.13	1.64	1.50	2.46	3.52	4.01	5.72	5.47	5.32	5.35	2.61	3.81
6h	4.26	4.43	4.27	2.93	1.56	1.62	2.50	3.51	4.03	5.02	4.11	3.89	4.33	2.59	3.29
7h	1.98	2.39	2.65	1.97	1.39	1.68	2.27	3.38	2.92	2.96	1.91	1.57	2.24	2.17	2.04
8h	0.19	0.99	0.82	0.71	0.83	1.64	1.92	2.54	1.38	1.13	0.23	0.18	0.59	1.40	0.83
9h	0.00	0.00	0.00	0.00	0.00	0.72	0.92	0.96	0.00	0.00	0.00	0.00	0.00	0.33	0.00
10h	2.24	1.66	1.38	0.55	0.00	0.04	0.00	0.00	0.00	1.31	1.94	2.50	1.84	0.00	0.75
11h	5.58	5.30	4.57	2.76	1.04	0.00	0.89	0.72	1.82	4.68	5.59	5.89	5.27	1.10	3.02
Noon.	9.08	8.77	8.23	5.66	2.83	1.19	2.34	2.23	4.60	8.47	9.33	9.44	8.89	3.04	5.79
1h	11.93	11.78	10.88	8.13	4.69	2.75	4.25	4.86	7.31	11.48	12.15	12.15	11.73	5.23	8.31
2h	12.99	13.55	12.16	9.35	6.01	4.02	5.86	6.72	9.12	12.94	13.41	13.21	13.04	6.75	9.72
3h	12.25	13.33	11.78	8.97	6.26	4.75	6.50	7.58	9.23	12.55	12.59	12.52	12.50	7.11	9.64
4h	10.80	11.50	10.00	7.62	5.42	4.33	5.73	7.27	8.17	10.62	10.81	11.13	10.81	6.32	8.40
5h	9.33	9.63	7.95	5.80	3.89	2.67	4.19	5.71	6.53	8.75	8.96	9.28	8.98	4.70	6.67
6h	8.17	7.93	6.55	5.06	2.84	2.35	3.60	4.49	4.99	7.22	7.46	8.09	7.57	3.79	5.51
7h	7.54	7.05	6.08	4.13	2.23	2.00	2.90	3.86	4.20	6.56	6.94	7.39	6.93	3.12	4.85
8h	7.37	6.72	5.46	3.28	1.62	1.44	1.98	3.10	3.71	6.11	6.93	7.08	6.61	2.42	4.35
9h	6.94	6.28	5.04	2.65	1.21	0.76	1.52	2.65	2.82	5.47	6.42	6.67	6.14	1.83	3.82
10h	6.33	5.81	4.32	2.56	1.31	0.55	0.95	2.09	3.04	4.99	5.86	6.16	5.58	1.65	3.44
11h	6.34	5.51	4.13	2.55	0.69	0.32	0.73	1.41	2.64	4.87	4.97	6.12	5.32	1.29	3.13
Means	6.587	6.510	5.486	3.804	2.154	1.641	2.492	3.277	4.085	6.136	6.410	6.619	6.291	2.807	4.380

The general means for every month, semi-annual period, and the year, inserted at the bottom of this table, are useful for the purpose of reducing observations on the magnetic declination to the mean of the day on which they were made. This can, of course, only give an approximate result, as the day of observation may be a disturbed one, and the mean solar diurnal variation varies within the eleven years' period.

From an inspection of Table 19, exhibiting the curves for the solar diurnal variation of the magnetic declination, we gather that the maximum in Easterly declination occurs during the summer months at or about 2^h in the afternoon, while the minimum takes place about 15 minutes before 9^h in the morning, the extremes during the winter months occurring respectively a short time before 3^h in the afternoon and about 20 minutes before 10^h in the morning. The single months oscillate slightly about these limits, exhibiting on the whole a regular cycle throughout the year with reference to the time of the occurrence of the extremes in magnetic declination. Concerning the extent of the oscillation we shall speak further below.

The next table gives also the mean solar diurnal variation, but the larger disturbances are in this case eliminated. On plate 18, we have the results thrown into curves.

MEAN SOLAR DIURNAL VARIATIONS IN THE MAGNETIC DECLINATION.
(LARGER DISTURBANCES ELIMINATED.)

HOUR.	DURING THE YEARS 1858 TO 1863.														
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Summ.	Winter	Year.
Midnight.	6.64	5.76	4.90	2.83	1.10	0.67	1.30	1.25	3.00	5.62	5.72	6.00	5.77	1.57	3.54
1 ^h	6.42	5.77	4.80	3.01	1.64	0.86	1.23	1.33	3.35	5.96	5.97	6.18	5.85	1.78	3.69
2 ^h	6.51	5.59	4.98	3.13	1.75	1.42	1.93	1.88	3.56	6.04	6.13	6.29	5.92	2.16	3.91
3 ^h	6.09	5.89	4.99	3.35	1.83	1.59	2.20	2.42	4.02	6.22	6.52	6.14	5.97	2.45	4.08
4 ^h	6.27	6.04	4.92	3.31	2.42	1.90	2.27	2.79	4.36	6.35	6.48	6.08	6.02	2.72	4.24
5 ^h	5.51	5.79	4.84	3.28	2.13	1.79	2.24	2.78	4.13	6.01	5.57	5.29	5.50	2.60	3.92
6 ^h	4.28	4.57	4.44	3.14	2.06	1.90	2.02	2.82	4.23	5.04	3.90	3.91	4.36	2.57	3.34
7 ^h	2.09	1.98	2.65	2.08	1.67	1.97	2.10	2.70	3.16	2.97	1.87	1.50	2.18	2.16	2.04
8 ^h	0.43	0.64	0.86	0.66	1.22	1.86	1.96	1.85	1.57	0.96	0.50	0.07	0.58	1.40	0.86
9 ^h	0.00	0.00	0.00	0.00	0.34	0.86	0.82	0.31	0.00	0.00	0.00	0.00	0.00	0.27	0.00
10 ^h	2.81	1.74	1.71	0.68	0.00	0.00	0.00	0.00	0.07	1.43	1.91	2.28	1.98	0.00	0.86
11 ^h	5.89	5.26	4.92	2.97	0.92	0.01	0.65	0.60	1.75	4.86	5.52	5.96	5.40	1.03	3.09
Noon	9.50	8.77	8.62	5.81	2.76	1.14	2.08	2.08	4.67	8.72	9.39	9.37	9.06	2.97	5.89
1 ^h	12.18	11.76	11.27	8.32	4.68	2.72	4.03	4.51	7.38	11.71	12.14	11.97	11.84	5.15	8.37
2 ^h	13.11	13.53	12.59	9.24	6.17	4.00	5.71	6.42	9.26	13.16	13.28	13.49	13.19	6.68	9.81
3 ^h	12.29	13.23	12.29	9.00	6.60	4.75	6.28	7.03	8.99	12.80	12.71	12.67	12.66	6.99	9.70
4 ^h	11.02	11.61	10.08	7.52	5.82	4.40	5.60	6.76	7.99	10.74	10.95	11.46	10.98	6.23	8.47
5 ^h	9.43	9.64	8.08	5.95	4.26	2.60	3.91	5.21	6.40	8.86	9.10	9.32	9.07	4.60	6.71
6 ^h	8.44	8.08	6.75	5.52	3.16	2.05	3.35	3.99	5.39	7.38	7.64	7.94	7.70	3.79	5.62
7 ^h	7.83	7.20	6.47	4.67	2.70	2.08	2.87	3.23	4.11	6.92	7.11	7.35	7.15	3.16	5.02
8 ^h	7.75	6.94	6.17	4.21	2.22	1.51	2.33	2.83	3.98	6.53	7.05	7.16	6.93	2.73	4.70
9 ^h	7.45	6.67	5.65	3.30	1.72	1.00	1.86	2.29	3.26	6.29	6.66	6.86	6.60	2.12	4.23
10 ^h	6.85	6.20	5.27	3.15	1.21	0.71	1.31	1.60	3.36	5.85	6.29	6.69	6.19	1.77	3.85
11 ^h	6.81	5.92	4.95	3.46	1.21	0.66	0.95	1.32	3.02	5.39	5.72	6.25	5.84	1.65	3.61
Means	6.900	6.607	5.925	4.108	2.441	1.769	2.458	2.833	4.209	6.494	6.589	6.676	6.531	2.856	4.564

In this, as in the former table, the monthly, yearly, and semi-annual means have been taken, with the special object, however, in this case, of being inserted in their respective interpolation series. The values above given have been treated according to the method of the least squares and Bessel's formula, whereby we obtained the following equations:

January	$D^{(n)} = 6.900 + 3.460 \sin (n 15^\circ + 10^\circ 15') + 2.855 \sin (n 30^\circ + 17^\circ 47')$ $+ 1.478 \sin (n 45^\circ + 37^\circ 6') + \dots$
February	$= 6.607 + 3.484 \sin (n 15^\circ + 15^\circ 27') + 3.143 \sin (n 30^\circ + 9^\circ 35')$ $+ 1.565 \sin (n 45^\circ + 25^\circ 7') + \dots$
March	$= 5.925 + 3.116 \sin (n 15^\circ + 23^\circ 4') + 2.743 \sin (n 30^\circ + 11^\circ 34')$ $+ 1.596 \sin (n 45^\circ + 23^\circ 54') + \dots$
April	$= 4.108 + 2.373 \sin (n 15^\circ + 26^\circ 12') + 2.154 \sin (n 30^\circ + 3^\circ 6')$ $+ 1.131 \sin (n 45^\circ + 18^\circ 25') + \dots$
May	$= 2.441 + 1.659 \sin (n 15^\circ + 36^\circ 3') + 1.641 \sin (n 30^\circ + 347^\circ 48')$ $+ 0.753 \sin (n 45^\circ + 348^\circ 40') + \dots$
June	$= 1.769 + 1.129 \sin (n 15^\circ + 43^\circ 59') + 1.273 \sin (n 30^\circ + 334^\circ 10')$ $+ 0.603 \sin (n 45^\circ + 337^\circ 15') + \dots$
July	$= 2.458 + 1.410 \sin (n 15^\circ + 33^\circ 20') + 1.510 \sin (n 30^\circ + 336^\circ 24')$ $+ 0.716 \sin (n 45^\circ + 337^\circ 4') + \dots$
August	$= 2.833 + 1.627 \sin (n 15^\circ + 32^\circ 58') + 1.963 \sin (n 30^\circ + 329^\circ 0')$ $+ 0.947 \sin (n 45^\circ + 341^\circ 8') + \dots$
September	$= 4.209 + 1.886 \sin (n 15^\circ + 22^\circ 33') + 2.414 \sin (n 30^\circ + 349^\circ 34')$ $+ 1.361 \sin (n 45^\circ + 0^\circ 4') + \dots$
October	$= 6.494 + 2.950 \sin (n 15^\circ + 16^\circ 23') + 3.163 \sin (n 30^\circ + 8^\circ 10')$ $+ 1.650 \sin (n 45^\circ + 25^\circ 50') + \dots$
November	$= 6.589 + 3.294 \sin (n 15^\circ + 14^\circ 21') + 3.194 \sin (n 30^\circ + 14^\circ 52')$ $+ 1.575 \sin (n 45^\circ + 38^\circ 6') + \dots$
December	$= 6.676 + 3.445 \sin (n 15^\circ + 13^\circ 15') + 3.148 \sin (n 30^\circ + 16^\circ 33')$ $+ 1.484 \sin (n 45^\circ + 36^\circ 44') + \dots$
Summer	$= 6.531 + 3.281 \sin (n 15^\circ + 15^\circ 21') + 3.052 \sin (n 30^\circ + 14^\circ 35')$ $+ 1.625 \sin (n 45^\circ + 35^\circ 10') + \dots$
Winter	$= 2.856 + 1.666 \sin (n 15^\circ + 31^\circ 0') + 1.788 \sin (n 30^\circ + 344^\circ 40')$ $+ 0.874 \sin (n 45^\circ + 352^\circ 40') + \dots$
Year	$= 4.564 + 2.455 \sin (n 15^\circ + 20^\circ 38') + 1.691 \sin (n 30^\circ + 3^\circ 34')$ $+ 1.173 \sin (n 45^\circ + 20^\circ 37') + \dots$

The factors of the first terms in the various equations throughout the year were now again developed into a series; and commencing with the 1st of January, we have:

$$D^{(n)} = 2.486 + 1.245 \sin \left((n + \frac{1}{2}) 30^\circ + 49^\circ 13' \right) + 0.129 \sin \left((n + \frac{1}{2}) 60^\circ + 220^\circ 49' \right) \\ + 0.137 \sin \left((n + \frac{1}{2}) 90^\circ + 143^\circ 14' \right).$$

8. Amplitude in the Solar Diurnal Variation of the Magnetic Declination. The table in this paragraph shows the amplitude in the solar diurnal variation for the various months and years of observation, derived both from *all observations*, and also from *observations, the larger disturbances having been eliminated*. In the last column of each of these groups a mean amplitude for the whole period of observation is inserted.

AMPLITUDE IN THE SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION.

MONTHS.	Derived from all observations.						Larger disturbances eliminated.					
	18 $\frac{58}{100}$	18 $\frac{59}{100}$	18 $\frac{60}{100}$	18 $\frac{61}{100}$	18 $\frac{62}{100}$	1858-63	18 $\frac{58}{100}$	18 $\frac{59}{100}$	18 $\frac{60}{100}$	18 $\frac{61}{100}$	18 $\frac{62}{100}$	1858-63
January	12.25	14.78	14.18	(12.69)	11.12	13.00	12.09	15.03	14.28	(12.59)	11.46	13.09
February	14.36	15.42	12.85	13.02	12.56	13.64	13.89	15.54	13.02	12.85	12.71	13.60
March	(10.24)	10.09	13.49	14.20	10.88	11.78	(10.69)	10.24	14.26	14.82	11.46	12.29
April	(7.33)	8.75	9.90	10.57	8.12	8.93	(7.10)	8.42	9.90	10.48	8.31	8.84
May	4.97	6.35	7.60	7.58	6.68	6.64	4.85	(7.17)	7.60	7.67	6.70	6.80
June	4.48	6.26	5.83	4.43	4.49	5.10	3.69	6.26	5.80	4.96	4.86	5.11
July	4.23	9.05	7.31	6.14	7.09	6.76	4.15	8.36	7.66	6.14	(6.32)	6.53
August	5.28	11.47	8.76	6.07	7.47	7.81	5.12	11.50	7.83	6.26	7.63	7.67
September	8.76	11.35	10.15	9.40	9.23	9.78	8.53	12.91	9.86	9.24	8.41	9.79
October	13.44	14.68	13.79	11.49	11.31	12.94	13.57	15.07	13.90	11.71	11.78	13.21
November	13.14	15.39	13.45	13.23	11.84	13.41	13.28	15.39	13.34	13.30	12.04	13.47
December	11.83	17.09	12.44	13.46	11.69	13.30	12.28	17.51	12.65	13.46	12.63	13.71
Summer	12.543	14.575	13.367	13.015	11.567	13.013	12.633	14.797	13.575	13.122	12.013	13.228
Winter	5.842	8.872	8.258	7.365	7.180	7.503	5.573	9.103	8.108	7.458	7.038	7.456
Year	9.192	11.723	10.813	10.190	9.373	10.258	9.103	11.950	10.842	10.290	9.526	10.342

The values in the above table enclosed within parentheses have been obtained by interpolation, as actual observations were wanting, or not sufficiently reliable, in those cases.

The mean amplitudes, as given in the last columns of each of the groups are somewhat different from those we obtain by the Hourly Variation Tables of the last paragraph; for from these we derive the following values for the mean amplitude in solar diurnal variation throughout the year:

WINTER MONTHS.	Mean Amplitudes, 1858-63.		SUMMER MONTHS.	Mean Amplitudes, 1858-63.	
	All Observations.	Larger Disturbances eliminated.		All Observations.	Larger Disturbances eliminated.
April... ..	9.35	9.24	October.	13.94	13.16
May	6.26	6.60	November	13.49	13.28
June	4.75	4.75	December	13.21	13.49
July	6.50	6.28	January	12.99	13.11
August.	7.58	7.03	February	13.55	13.53
September	9.23	9.26	March	12.16	12.59
Mean	7.110	6.983	Mean	13.040	13.193
Yearly mean	9.720	9.803			

The differences between these values and the corresponding values in the former table are due to the difference in the modes in which the amplitudes in the two cases were derived. In order fully to understand this, it must be borne in mind that, in the former case, the mean amplitudes for the whole period were obtained irrespective of the time at which the extremes occur in the single years, whereas in the latter the various values have been derived with respect to the single hours of the day, and consequently represent the more exact values of the amplitude in the diurnal variation for the single months and periods of the year.

With respect to the former table, we have yet to add a few words. The period over which the observations extend being too short to allow of its being discussed with a view to arrive at conclusions respecting the eleven years, period, it may suffice to point out that the above series of annual means for the amplitude of the magnetic declination shows distinct evidence of the existence of the maximum in the eleven years, period; for we notice that the maximum mean value takes place in the year 1859—60, and that the value for the years following it show a gradual decrease towards the minimum value in the amplitude of the magnetic declination

9. Semi-annual Inequality in the Solar Diurnal Variation of the Magnetic Declination. If we take the mean of the solar diurnal variation, derived from 24 hours, and from all observations, for summer, winter, and the year, we obtain, respectively, the means: 6'29, 2'81, and 4'38. These mean values are then to be subtracted from the values for the several hours from which they were derived, in order to obtain the values in the following table.

	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Summer	+ 2'60	+ 5'44	+ 6'75	+ 6'21	+ 4'52	+ 2'69	+ 1'28	+ 0'64	+ 0'32	- 0'15	- 0'71	- 0'97
Winter	+ 0'23	+ 2'42	+ 3'94	+ 4'30	+ 3'51	+ 1'89	+ 0'98	+ 0'31	- 0'39	- 0'98	- 1'16	- 1'52
Year	+ 1'41	+ 3'93	+ 5'34	+ 5'26	+ 4'02	+ 2'29	+ 1'13	+ 0'47	- 0'03	- 0'56	- 0'94	- 1'25
Summer <i>minus</i> year	+ 1'19	+ 1'51	+ 1'41	+ 0'95	+ 0'50	+ 0'40	+ 0'15	+ 0'17	+ 0'35	- 0'41	+ 0'23	+ 0'28
Winter <i>minus</i> year	- 1'18	- 1'51	- 1'40	- 0'96	- 0'51	- 0'40	- 0'15	- 0'16	- 0'36	- 0'40	- 0'22	- 0'27
	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Summer	- 1'14	- 0'93	- 0'83	- 0'80	- 0'49	- 0'94	- 1'96	- 4'05	- 5'70	- 6'29	- 4'45	- 1'0
Winter	- 1'42	- 1'17	- 0'79	- 0'53	- 0'21	- 0'20	- 0'22	+ 0'62	- 1'41	- 2'48	- 2'81	- 1'71
Year	- 1'28	- 1'05	- 0'81	- 0'66	- 0'35	- 0'57	- 1'09	- 2'34	- 3'55	- 4'38	- 3'63	- 1'34
Summer <i>minus</i> year	+ 0'14	+ 0'12	- 0'02	- 0'14	- 0'14	- 0'37	- 0'87	- 1'71	- 2'15	- 1'91	- 0'82	+ 0'34
Winter <i>minus</i> year	- 0'14	- 0'12	+ 0'02	+ 0'13	+ 0'14	+ 0'37	+ 0'87	+ 1'71	+ 2'14	+ 1'90	+ 0'82	- 0'35

The differences "summer *minus* year" and "winter *minus* year" represent the semi-annual inequality, and have been thrown into curves on Table 19.

10. Lunar Diurnal Variation of the Magnetic Declination. The labours in connexion with the discussion of the observations bearing on this subject have been embodied

in a Paper read before the *Royal Society* on the 28th of March, 1867, and printed in the *Philosophical Transactions*. The same may be reprinted here.

(XV.) *On the Lunar-diurnal Variation of the Magnetic Declination, with special regard to the Moon's Declination.* By G. NEUMAYER. Communicated by the President.

The hourly records on the magnetic declination, systematically kept at the Flagstaff Observatory at Melbourne, Victoria, during the period from the 1st of May, 1858, to the 28th of February, 1863, have been discussed with a view to determine the lunar-diurnal variation to which this magnetic element is subjected. The results arrived at in the course of this discussion, eliciting, as I believe, facts hitherto unnoticed, induced me to think it important to have them brought before the Royal Society, with no other object in view but to direct the attention of scientific men to a subject of such vast import for the development of the science of terrestrial magnetism.

The process adopted in reducing the observations, in order to eliminate the solar-diurnal variation of the magnetic declination, is identical with that generally adopted in such cases. The limit of disturbance was taken to be 3.61 minutes of arc, and all hourly directions which differed from their final normals by this value, or more, were consequently omitted from the record. This elimination of the larger disturbances having been effected, from every remaining reading (R) of the magnet's direction the respective final normal (N) was subtracted, thus causing the residuals (R—N) to be devoid of the influence of the solar-diurnal variation. When the remainders are negative, *i. e.* when the normal exceeds the reading, the North end of the needle is to the West of its mean direction, and when positive the needle deviates with its North end towards the East of its normal mean. The magnetic declination being East at Melbourne, we perceive that the negative values denote a decrease, and the positive an increase, with respect to the normal value of this magnetic element. The total number of observations at command amounts to 38,194, of which 4,178 single readings were excluded from the discussion on account of their being beyond the above-mentioned limit, and there remained only 34,016 readings for the purpose of determining the lunar-diurnal variation. Of this number 15,735 were observed in the months from April to September, and 18,281 during the time from October to March.

The treatment of the residuals, with a view to classify them according to lunar hours presents no particularly new features; so much may, however, be mentioned that, prior to entering upon any general discussion, every month's result was calculated separately and expressed in minutes. Subsequently the values for the various months were arranged, irrespective of the year, in two groups, *viz.*, the sun's declination being South (October to March), and the sun's declination being North (April to September). Thus we obtained a mean lunar-diurnal variation curve for each half of the year, from which again was derived the annual curve. A more rigid examination of the results obtained in this way showed at once that irregularities in the lunar-diurnal variation manifested themselves, for which it was hardly possible to account otherwise, than that they were depending to some degree on the moon's position with reference to the equator, whether her declination was South or North.

After having been once convinced of the truth of this, there could not exist a doubt as to the mode in which the observations had to be treated. The whole series was arranged in groups, "Declination of the moon South" and "Declination of the moon North," rejecting

all days on which the moon was close to the equator, so as to cause her declination to be divided between the hours of the day. The 118 groups of lunar-diurnal variation thus formed were subsequently classified according to whether the sun's declination was South or North, which was easily accomplished, as of each group only the sums expressed in minutes of arc had been taken. The mean values for each period were derived by paying due weight to the number of readings from which it had been derived, a practice which was made a rule in the course of these discussions. The only exception to this in the subsequent tables occurs in those values of the lunar-diurnal variation for the winter and summer half-year in the single years, they being derived from the monthly tables by simply taking the means. This must be borne in mind when comparing the various values, as in some instances there are considerable discrepancies caused by this difference of treatment, which are, however, quite irrelevant for the purpose required. It ought to be mentioned that the mean values were subsequently reduced to seconds of arc.

Originally, as I have already described, I obtained yearly and half-yearly curves of the lunar-diurnal variation from the monthly tables; and it is evident that the results obtained by the method just described, afforded a means of checking those of the inquiry primarily instituted, as far as both could reasonably be expected to tally with one another, the principles of classification being somewhat different in both cases. Taking this into consideration, the agreement between the results was such as to cause us to receive the subsequent mean values with great confidence.

The values of the first table are to be considered as derived irrespectively of the years during which the observations were made, and to represent mean values for the period from May, 1858, to February, 1863. We shall presently see that this point is of some moment, the single years differing widely in their results with regard to the lunar-diurnal variation of the magnetic declination.

LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION (1858-1863).

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

Declination of the		LUNAR HOURS.											
Sun.	Moon.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
S. and N.	S. and N.	+ 6.38	+ 7.84	+ 5.13	- 0.89	- 5.86	- 9.23	- 11.74	- 12.10	- 9.04	- 2.06	+ 6.16	+ 10.31
S.	"	+ 13.18	+ 16.33	+ 10.20	+ 1.15	- 10.04	- 15.96	- 20.64	- 15.55	- 10.32	- 0.90	+ 10.61	+ 12.67
N.	"	- 1.79	- 1.98	- 0.82	- 3.30	- 1.00	- 1.43	- 1.61	- 8.12	- 7.60	- 3.39	+ 1.05	+ 7.54
S. and N.	S.	+ 9.08	+ 9.35	+ 7.48	- 0.29	- 8.23	- 8.62	- 12.87	- 7.35	- 6.31	+ 4.36	+ 9.09	+ 9.74
S.	"	+ 17.73	+ 18.01	+ 13.64	+ 1.91	- 14.39	- 18.08	- 24.18	- 13.14	- 7.97	+ 8.85	+ 15.94	+ 12.27
N.	"	- 1.68	- 0.93	+ 0.02	- 3.08	- 0.77	+ 3.05	+ 0.67	- 0.33	- 4.29	- 1.00	+ 1.02	+ 6.71
S. and N.	N.	+ 3.72	+ 6.33	+ 2.78	- 1.50	- 3.44	- 9.83	- 10.62	- 16.76	- 11.83	- 8.46	+ 3.24	+ 10.88
S.	"	+ 8.56	+ 14.62	+ 6.67	+ 0.33	- 5.43	- 13.64	- 16.96	- 18.02	- 12.87	- 10.96	+ 5.17	+ 13.07
N.	"	- 1.90	- 3.01	- 1.64	- 3.50	- 1.22	- 5.72	- 3.76	- 15.36	- 10.74	- 5.68	+ 1.09	+ 8.36

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

Declination of the		LUNAR HOURS.											
Sun.	Moon.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
S. and N.	S. and N.	+ 11.38	+ 10.38	+ 7.01	+ 2.43	- 4.33	- 7.42	- 6.69	- 7.83	- 8.03	- 5.15	+ 3.13	+ 6.25
S.	"	+ 17.45	+ 16.55	+ 10.25	+ 2.29	- 4.06	- 12.82	- 12.86	- 17.18	- 12.25	- 4.23	+ 5.12	+ 10.71
N.	"	+ 4.33	+ 3.24	+ 3.30	+ 2.60	- 4.64	- 1.26	+ 0.37	+ 3.07	- 3.01	- 6.27	+ 0.80	+ 1.04
S. and N.	S.	+ 8.67	+ 4.33	+ 4.84	+ 1.92	- 3.23	- 4.54	- 7.01	- 8.46	- 7.53	- 5.80	+ 1.73	+ 7.65
S.	"	+ 15.19	+ 9.42	+ 5.83	+ 1.62	+ 0.97	- 5.58	- 13.03	- 21.11	- 13.29	- 5.25	+ 4.28	+ 13.14
N.	"	+ 1.20	- 1.68	+ 3.69	+ 2.27	- 8.20	- 3.33	0.00	+ 6.24	- 0.56	- 6.48	- 1.39	+ 0.96
S. and N.	N.	+ 14.10	+ 16.64	+ 9.20	+ 2.96	- 5.42	- 10.36	- 6.35	- 7.19	- 8.55	- 4.51	+ 4.51	+ 4.84
S.	"	+ 19.73	+ 24.06	+ 14.81	+ 2.99	- 9.28	- 20.35	- 12.68	- 13.27	- 11.18	- 3.20	+ 5.98	+ 8.17
N.	"	+ 7.52	+ 8.22	+ 2.98	+ 2.92	- 0.96	+ 0.83	+ 0.75	- 0.09	- 5.45	- 6.06	+ 2.86	+ 1.12

The values of this table have been thrown into curves which may be readily studied by the aid of Plate 22.; it was considered advisable to retain the plan adopted in the above table and exhibit the nine curves in three different groups, namely:—

Group I.:—Declination of the moon *South and North*, *i. e.* no distinction being made with reference to the moon's declination.

1. No distinction with reference to the sun's declination (this may be called the mean yearly curve).
2. The sun's declination South (summer half-yearly curve).
3. The sun's declination North (winter half-yearly curve).

Group II.:—Declination of the moon *South*.

1. No distinction with reference to the sun's declination (yearly South curve).
2. The sun's declination South (the summer half-yearly South curve).
3. The sun's declination North (winter half-yearly South curve).

Group III.:—Declination of the moon *North*.

1. No distinction with reference to the sun's declination (yearly North curve).
2. The sun's declination South (summer half-yearly North curve).
3. The sun's declination North (winter half-yearly North curve).

A glance at the curves of Plate 22 shows that the lunar-diurnal variation must be regarded as being influenced by both the sun and the moon, for we perceive that, when the declinations of both heavenly bodies are of the same name, both North or both South, the curves show greater regularity than they exhibit otherwise. For instance: the summer half-yearly South curve is far less irregular than the summer half-yearly North curve; the winter half-yearly South curve scarcely deserves the name of such, while the winter half-yearly North curve exhibits the oscillations in a far higher degree, although they are still somewhat irregular.

The doubt so often raised, whether during the winter season any lunar-diurnal variation were traceable at all, can, I think, not be entertained any longer, if we pay due attention to the facts which may be gleaned from our table. Indeed, we shall presently see, when speaking of the lunar-diurnal variation in the various years of observation, that in some cases the variation manifests itself in a very distinct manner even during those months when the sun's declination is North.

The principal features of the curves just enumerated may be delineated as follows:—

Ad I. 1. The maximum value of the easterly deviation of the needle takes place at the time of the moon's lower transit, and the minimum between 6^h and 7^h. A secondary maximum occurs at 1^h, and a corresponding minimum between 19^h and 20^h. The range of oscillation amounts to 24".0.

Ad I. 2. In this case the maximum seems to occur a little after the moon's lower transit and the minimum at 6^h, while a secondary maximum takes place at 1^h and a secondary minimum at 19^h, the greatest range amounting to 38".69.

Ad I. 3. I consider it most likely that in this instance two influences, counteracting each other in some measure, make themselves manifest, and it is therefore rather difficult to determine the extreme deviations so well as in the former cases; but it appears that 11^h and the hour between 7^h and 8^h are marked as extremes, in the first instance the easterly deviation reaching its

greatest value, and in the latter the same occurring with respect to the westerly deviation of the needle. The greatest range amounts to $15''\cdot66$.

The nodes, where the three curves intersect each other, are at the hours 15^h — 16^h , $20^h\ 45^m$, $3^h\ 20^m$, and $8^h\ 40^m$.

Ad II. 1. The maximum of the East magnetic declination occurs at 11^h , the minimum at 6^h , the greatest range amounting in this case to $22''\cdot61$. A secondary maximum takes place at 1^h , and a secondary minimum at 19^h .

Ad II. 2. Primary maximum about 30^m past the superior passage of the moon, and the corresponding minimum at 6^h , with a range of $42''\cdot17$. Secondary maximum at 10^h , and minimum at 19^h .

Ad II. 3. There is in this case scarcely any regularity in the oscillations of the needle observable, the extreme values differing by $14''\cdot91$.

On account of the irregularity of the winter curve the nodes for this group are not well defined; they seem, however, to be between $14^h\ 30^m$ and $16^h\ 50^m$, and at $20^h\ 50^m$, $3^h\ 15^m$ and $8^h\ 30^m$.

Ad III. 1. Maximum at 13^h and minimum at 7^h , giving a range of $33''\cdot40$; secondary extremes are noticeable at 1^h and 17^h .

Ad III. 2. Maximum at 13^h , minimum at 17^h , greatest range $44''\cdot41$; secondary maximum and minimum respectively at 1^h and 7^h . It is yet to be decided whether the deviation from the rule, that the minimum between the inferior and the superior passage exceeds that between the superior and the inferior, is due rather to an accidental irregularity than to an actual change; but the latter is undoubtedly the case with reference to the maximum, comparing it with the summer semi-annual curve obtained irrespective of the moon's declination.

Ad III. 3. This curve shows but one distinctly expressed maximum and minimum, viz at 11^h (or perhaps near the inferior transit) and at 7^h , the range of oscillation amounting to $23''\cdot72$.

The intersecting points are in this group of curves more distinctly determined than in both the preceding; they are at 15^h , $20^h\ 40^m$, $3^h\ 30^m$, and $9^h\ 50^m$.

Prior to entering on the examination of the lunar-diurnal variation in various years, I may be permitted to add a few words on the semi-annual inequality for the several groups of curves, taking in every one of the annexed diagrams (Plate 23) the annual curve for the axis of projection.

Diagram I. (Plate 23) illustrates in the usual manner the semi-annual inequality of the lunar-diurnal variation, no distinction being made respecting the name of the moon's declination.

Diagram II. shows the semi-annual inequality of the lunar-diurnal variation only for declinations of the moon South of the equator.

Diagram III. represents the semi-annual inequality of the lunar-diurnal variation for declinations of the moon North of the equator.

In every one of these cases the summer branch (October to March) bears the character of the lunar-diurnal variation, even as far as the turning hours are concerned. We notice also a marked difference between the curve when the moon is South of the equator (II.) and the one when her declination is North (III.). A glance at the diagrams will convince us of this; we need only to point out that the range of oscillation in the first instance, taking both branches

into consideration, is $27^{\circ}35'$, in the last but $22^{\circ}18'$, and that the extremes occur in the latter case two hours earlier than in the former. Besides these differences there are others of minor import which also contribute towards drawing a distinction between the curves for North and South declinations of the moon; for instance, the secondary extremes differ in the South curve by $24^{\circ}85'$, whilst the corresponding deviation in the North curve is but $13^{\circ}20'$.

On examining the results of this inquiry for the several years of observation somewhat closer, we are struck by the differences which they exhibit among themselves. It was the year 1861 which first called my attention to this fact by manifesting considerable abnormities with respect to every one of the curves of the lunar-diurnal variation for the various seasons and positions of the moon. These irregularities are the more striking, as the year 1860 does not exhibit any such extraordinary deviations from the mean values for the several years, although also in this case the curve for the winter half-year shows some peculiarly interesting features (Plate 23).

The subjoined table gives the lunar-diurnal variation for the years 1860 and 1861, and Plate 23 shows the respective curves.

LUNAR-DIURNAL VARIATION OF THE MAGNETIC DECLINATION FOR THE YEARS 1860 AND 1861.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

Declination of the		Years.	LUNAR HOURS.											
Sun.	Moon.		0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
S. and N.	S. and N.	1860	"	"	"	"	"	"	"	"	"	"	"	"
		1861	"	"	"	"	"	"	"	"	"	"	"	"
"	S.	1860	+ 7.28	+ 6.80	+ 6.03	+ 2.77	- 3.90	- 9.65	-18.09	-14.91	-14.45	- 6.73	+ 2.86	+12.92
		1861	- 5.87	- 8.76	- 6.82	-13.38	- 9.69	- 8.96	-12.88	-10.92	- 6.10	- 1.09	+ 6.84	+17.21
"	N.	1860	+11.54	+ 8.60	+10.37	+ 3.50	- 5.39	-11.70	-27.16	-21.65	-24.92	- 7.52	+ 2.04	+ 6.50
		1861	+ 4.18	- 2.47	- 1.96	- 5.34	-10.59	- 6.69	-11.71	+ 5.10	+ 4.33	+14.86	+17.14	+23.76
"	S. and N.	1860	+ 3.56	+ 5.21	+ 2.14	+ 2.03	- 2.60	- 7.79	- 9.73	- 8.47	- 4.46	- 5.98	+ 3.67	+18.92
		1861	-15.61	-14.78	-11.57	-21.13	- 8.72	-11.37	-14.03	-25.98	-15.98	-15.91	- 2.66	+10.79
S.	"	1860	+13.97	+13.91	+ 9.88	- 0.24	-11.62	-20.48	-19.91	-23.07	-16.05	- 4.06	+ 9.47	+17.84
		1861	+ 3.64	+ 1.74	+ 5.61	- 1.40	-12.78	-18.36	-22.62	-13.65	- 3.32	- 1.59	+ 8.12	+12.78
N.		1860	+ 2.08	- 0.65	+ 2.76	+ 4.76	+ 1.37	+ 0.97	- 3.97	- 6.56	-11.30	-10.56	- 2.68	+ 5.63
		1861	-17.98	+19.65	-19.96	-25.84	- 7.32	+ 2.30	- 1.07	- 5.67	- 5.95	+ 0.12	+ 4.50	+17.76

2nd. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

Declination of the		Years.	LUNAR HOURS.											
Sun.	Moon.		12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
S. and N.	S. and N.	1860	"	"	"	"	"	"	"	"	"	"	"	"
		1861	"	"	"	"	"	"	"	"	"	"	"	"
"	S.	1860	+ 4.75	+ 1.66	+ 2.38	- 0.85	- 1.42	- 8.02	+ 6.20	- 5.07	- 2.48	+ 4.82	+13.51	+14.30
		1861	+25.07	+21.33	+19.80	+15.81	+ 7.60	+ 3.85	- 5.35	- 4.32	-10.47	-10.01	- 3.01	- 2.68
"	N.	1860	- 1.04	- 9.18	- 6.99	- 6.31	- 9.43	-14.45	+ 1.42	-12.17	- 6.04	- 0.31	+12.47	+19.40
		1861	+27.28	+21.70	+17.03	+11.34	+ 7.91	+ 8.37	- 3.19	- 2.25	- 6.35	- 3.24	- 1.30	+ 2.22
"	S. and N.	1860	+10.20	+12.13	+11.32	+ 4.27	+ 6.34	- 2.04	+11.08	+ 1.79	+ 0.82	+ 9.53	+14.43	+ 9.48
		1861	+22.79	+20.96	+22.53	+20.30	+ 7.26	- 0.79	- 7.52	- 6.21	-14.56	-16.38	- 4.66	- 7.49
S.	"	1860	+14.93	+12.92	+12.34	+ 1.98	+ 5.91	-14.15	+ 1.45	-17.46	-12.16	- 2.34	+12.43	+16.25
		1861	+24.34	+20.26	+27.67	+12.90	+ 1.49	- 0.89	-11.25	-12.61	-15.87	- 5.68	+ 3.17	+ 8.53
N.		1860	- 4.06	- 9.39	- 8.19	- 4.62	- 8.51	- 2.50	+ 8.90	+ 7.07	+ 8.44	+12.33	+16.99	+13.91
		1861	+20.96	+18.10	+20.26	+16.84	+12.41	+ 5.93	+ 1.02	+ 7.71	- 6.64	-16.16	-10.53	-14.84

One glance at this table informs us of the great difference between the several curves for the two years. The yearly curve for 1860 shows a maximum easterly declination at 23^h and a minimum at 6^h , with a secondary maximum at 11^h and a range of $32^{\circ}39'$; whilst the same curve for 1861 shows a maximum at the moon's lower transit, and a rather indistinctly expressed minimum at 3^h , the greatest range being $38^{\circ}45'$. Differences, similar to those just pointed

III. MAGNETIC HORIZONTAL FORCE.

HOURLY OBSERVATIONS.

12. As already mentioned in the Introduction, the instrument for measuring the horizontal component of the magnetic force had, according to Professor Lamont's construction, an arrangement for compensating the effects of temperature upon the two deflecting magnets used in this system of instruments. Both the magnets of deflection and compensation had, in the set of instruments first used (up to June, 1861), the shape of rhombi, while in the instruments subsequently employed, the vertical and longitudinal sections were rectangles. In setting the instrument for measuring the horizontal force, particular care was employed, that the effect of the deflecting magnets should be exactly equal, i.e., that the angle of deflection (ϕ) should be a minimum.

Looking from the scales towards the magnets, the magnetometer was placed in each case (in the old Horary House, the old Absolute House, and the new Horary House) to the right of the declinometer, the distance of the forepart of the scale from the mirror of the magnetometer being in each case the same as the respective distances in the declinometer.

From several measurements the distances of the declinometer from the magnetometer, and of both of these from the centre of the stand of the tubes, were found to be respectively 60.10 in. and 68.36 in., thus giving an angle of deflection $\phi = 52^\circ 9' 3''$. This applies to the Old Observatory, and the period from the 1st of May, 1858, to the end of June, 1862. During the short time the observations were made in the old Absolute House (July, August, and September, 1862), the distances of the declinometer from the magnetometer, and of both of these from the centre of the stand of the tubes, were respectively 62.0 in. and 70.75 in., from which the angle of deflection was found to be $\phi = 51^\circ 58' 4''$. In the Horary House of the New Observatory from the 1st of October, 1862, to the end of February, 1863, these distances were 62.57 in. and 69.71 in., and consequently the angle of deflection $\phi = 53^\circ 19' 75''$. The angles of deflection for the various periods were also determined by the aid of deflecting magnets and small deflectors, in the manner suggested in Professor Lamont's writings. The results were found to agree well with those above given; but as, in the subsequent determination of the value of a part of division, only the trigonometrically obtained values will be employed, I refrain from adding the others here.

What was said when speaking of the hourly observations on the magnetic declination, applies also with respect to the sense in which the scale of the instrument for measuring the horizontal force was divided. Subsequent to the 20th of October, 1860, the numbering of the scale was in the opposite direction; and if D denote the reading of the declinometer, H that of the instrument for the horizontal force, the actual reading of the latter (n') was, previous to the above date, $D - H$, and subsequently $H - D$, causing thereby the actual readings of the instruments to run in the same sense, namely, in such a manner, *that an increase in the readings corresponds with an increase in the magnetic horizontal force, and vice versa.*

The further treatment of the original observations, in order to obtain the subjoined tables, will be explained hereafter.

LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION 1858-1863.

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

YEAR.	MONTHS.	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
1858	May	-0.029	+0.152	-0.102	-0.060	-0.362	+0.123	+0.137	+0.296	+0.260	-0.127	-0.010	-0.095
	June	+0.172	+0.208	-0.005	+0.007	+0.047	+0.318	+0.143	+0.233	-0.131	+0.039	-0.042	-0.038
	July	+0.066	-0.234	+0.009	-0.054	-0.127	-0.289	+0.138	+0.253	-0.204	-0.111	-0.027	-0.163
	August	-0.291	-0.119	-0.333	-0.137	-0.118	-0.082	-0.171	-0.187	-0.051	-0.116	+0.139	+0.089
	September	+0.686	+0.492	-0.009	+0.038	-0.363	-0.293	-0.293	-0.437	-0.263	-0.349	-0.046	+0.200
	October	+0.496	+0.262	-0.107	+0.079	+0.097	+0.184	+0.095	-0.160	-0.075	+0.135	+0.180	+0.185
	November	+0.205	+0.296	-0.153	+0.044	-0.395	-0.350	-0.329	+0.035	-0.004	+0.037	+0.026	+0.338
	December	-0.018	+0.350	+0.475	+0.216	+0.342	+0.283	-0.374	-0.320	+0.010	-0.185	+0.291	+0.488
1859	January	-0.091	-0.372	-0.378	-0.692	-0.427	-0.557	-0.668	-0.220	-0.372	+0.371	+0.211	+0.119
	February	+0.317	+0.065	+0.091	+0.083	-0.224	+0.545	+0.645	+0.512	+0.089	-0.508	-0.208	+0.121
	March	+0.083	-0.316	-0.617	-0.089	-0.157	-0.711	-0.768	-0.638	-0.124	+0.303	+0.532	+0.601
	April	-0.172	-0.136	-0.277	-0.460	-0.529	-0.540	-0.125	-0.239	-0.393	+0.157	+0.581	+0.462
	May	-	-	-	-	-	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-	-	-	-	-	-
	July	-0.020	+0.165	+0.327	+0.421	+0.277	+0.120	-0.042	+0.360	-0.447	-0.362	-0.237	-0.257
	August	-0.145	-0.589	+0.453	+0.790	+0.512	+0.704	-0.067	+0.423	-0.443	-0.844	-0.313	-0.219
	September	+0.235	+0.150	+0.020	-0.993	-0.098	-0.579	-0.384	-0.861	-0.253	-0.840	-0.278	+0.078
	October	+0.330	+0.202	-0.228	-0.400	-0.269	-0.239	-0.357	-0.480	-0.429	-0.275	+0.115	+0.325
	November	+0.664	+0.610	+0.348	-0.065	-0.297	-0.510	-0.480	-0.090	-0.241	-0.129	+0.064	-0.026
	December	+0.288	+0.532	+0.825	+0.147	+0.423	-0.291	-0.177	-0.691	-0.535	-0.416	-0.674	-0.519
1860	January	+0.868	+1.004	+0.376	-0.321	-0.157	-0.613	-0.334	-0.567	-0.788	+0.278	+0.798	+0.589
	February	+0.238	+0.485	+0.334	+0.053	+0.075	-0.417	+0.110	-0.216	+0.076	+0.167	+0.135	+0.253
	March	-0.250	-0.370	+0.139	+0.027	+0.309	+0.034	+0.269	-0.078	+0.216	+0.402	+0.210	+0.276
	April	+0.193	+0.036	-0.229	+0.022	+0.044	-0.091	+0.444	+0.056	+0.254	+0.527	+0.726	+0.615
	May	-0.208	-0.293	+0.170	+0.375	+0.032	+0.071	+0.139	+0.110	+0.328	+0.068	+0.294	+0.039
	June	-0.356	-0.369	-0.014	-0.151	-0.124	+0.054	+0.253	+0.293	+0.157	+0.292	+0.189	+0.145
	July	-0.247	-0.378	-0.483	-0.676	-0.602	-0.431	+0.005	+0.173	+0.107	+0.212	+0.187	+0.149
	August	-0.022	-0.038	-0.253	-0.085	-0.292	-0.103	+0.043	+0.077	+0.040	+0.196	+0.188	+0.343
	September	+0.234	+0.103	-0.010	+0.053	+0.091	+0.044	+0.005	-0.002	-0.042	-0.062	+0.115	+0.100
	October	-0.269	-0.210	+0.075	+0.012	+0.001	-0.083	+0.050	-0.252	-0.264	-0.626	-0.180	+0.141
	November	+0.049	-0.064	-0.290	+0.148	+0.437	+0.076	+0.186	-0.134	-0.430	-0.324	-0.153	-0.062
	December	+0.857	+0.447	+0.600	+0.279	-0.074	-0.412	-0.136	-0.499	-0.026	-0.131	+0.433	+0.428
1861	January	+0.874	+0.587	+0.461	+0.281	-0.100	-0.484	-0.518	-0.562	-0.468	-0.451	+0.143	+0.299
	February	+0.070	+0.032	-0.275	-0.310	-0.414	-0.372	-0.141	-0.122	-0.278	+0.018	+0.148	+0.428
	March	+0.132	+0.472	+0.182	+0.271	+0.098	-0.193	-0.498	-0.419	-0.370	-0.016	+0.323	-0.340
	April	+0.428	+0.370	+0.438	+0.419	+0.252	-0.290	-0.367	-0.212	-0.182	-0.127	-0.387	-0.599
	May	+0.190	+0.145	+0.504	+0.408	+0.440	+0.305	-0.219	+0.001	-0.309	-0.711	-0.031	-0.293
	June	+0.370	-0.319	+0.065	+0.173	+0.085	+0.040	+0.313	+0.271	+0.100	-0.119	-0.164	-0.069
	July	+0.509	+0.616	+0.209	+0.063	+0.086	+0.263	+0.168	+0.128	-0.333	-0.294	-0.253	-0.343
	August	+0.116	+0.575	+0.525	+0.393	+0.330	+0.088	+0.156	+0.165	+0.080	-0.375	-0.296	-0.245
	September	+0.483	+0.423	+0.284	+0.228	+0.048	+0.187	+0.051	+0.418	-0.020	+0.010	+0.078	+0.065
	October	+0.665	+0.514	+0.456	+0.497	+0.370	+0.300	+0.098	-0.041	-0.171	-0.065	-0.446	-0.151
	November	+0.323	+0.051	+0.294	+0.218	-0.017	+0.241	-0.094	+0.149	+0.039	+0.315	+0.169	+0.245
	December	+0.370	+0.370	+0.649	+0.333	+0.212	+0.419	+0.028	-0.266	-0.339	-0.369	-0.020	+0.372
1862	January	-	-	-	-	-	-	-	-	-	-	-	-
	February	+0.471	+0.374	+0.571	+0.075	-0.279	-0.358	-0.041	+0.114	-0.521	+0.016	+0.487	+0.490
	March	-0.013	+0.132	+0.017	-0.134	-0.466	-0.584	-0.563	-0.465	-0.137	+0.018	-0.051	+0.244
	April	+0.372	+0.267	+0.139	-0.233	-0.234	-0.076	-0.152	-0.003	+0.017	+0.042	+1.065	+0.081
	May	+0.158	+0.022	-0.123	-0.117	-0.123	-0.056	-0.017	-0.286	+0.018	-0.081	-0.040	-0.054
	June	-0.288	+0.251	+0.095	+0.276	+0.189	-0.241	-0.292	-0.013	-0.146	-0.356	-0.432	-0.101
	July	-	-	-	-	-	-	-	-	-	-	-	-
	August	-	-	-	-	-	-	-	-	-	-	-	-
	September	-0.528	+0.197	+0.438	+0.248	-0.638	+0.405	+0.046	+0.009	+0.356	-0.263	+0.003	+0.587
	October	-0.337	+0.087	-0.079	+0.242	-0.364	-0.362	-0.072	+0.030	-0.305	+0.100	-0.139	+0.144
	November	-0.246	+0.015	+0.024	-0.124	-0.065	-0.354	-0.557	-0.459	-0.050	+0.511	+0.432	+0.221
	December	+0.412	+0.634	+0.300	+0.101	-0.057	-0.289	-0.254	-0.531	-0.475	-0.365	-0.142	+0.156
1863	January	+0.717	+0.423	-0.245	-0.565	-0.636	-0.392	-0.663	-0.422	+0.402	-0.043	+0.137	-0.333
	February	+0.315	+0.741	+0.402	+0.200	-0.349	-0.771	-0.642	-0.749	-0.446	-0.828	-0.346	+0.092
		+0.178	+0.171	+0.115	+0.029	-0.067	-0.122	-0.118	-0.123	-0.142	-0.105	+0.066	+0.106

out, will be found on examining the various curves, but it may suffice for the present to single out one of the most striking anomalies, if we are allowed to speak of such, our knowledge on this point being still very indistinct. I refer to the winter half-yearly curve, when the moon's declination is indiscriminately North and South. In 1860, we notice in this case a distinct maximum at 22^h and a minimum at 8^h , secondary extremes occurring at 11^h and 13^h ; the greatest range is $28''\cdot23$. But on examining the same curve for 1861 we find a vast difference; a maximum deviation towards the East at the moon's inferior passage and at 3^h , whereas it is scarcely possible to speak of secondary extremes, all other undulations appearing as accidental irregularities when compared with the main oscillation, with a range amounting to $43''\cdot82$. It can hardly escape our observation that both curves show a clear sweep, but in a very different sense; and we understand now the reason of the irregularity of the mean winter curve for the five years, which scarcely deserves the name of a curve. This fact frequently induced those more especially engaged in these pursuits to doubt the existence of a lunar-diurnal variation-curve during the absence of the sun from the hemisphere of observation, a notion which, after the above explanations, may safely be pronounced to be erroneous. We feel, however, also inclined to recognize in the facts above pointed out the excuse for such a conclusion.

The summer semi-annual curve for 1861 exhibits a secondary maximum and minimum, respectively, at 23^h and 20^h , the primary extremes occurring at the moon's lower passage and at 6^h . As all curves for this year exhibit similar anomalies, when compared with what we adopted for the rule, the idea suggested itself that some error might have crept into the discussion; but this was soon proved to be an erroneous supposition by a perfectly independent and fresh discussion which gave in the main points results identical with those arrived at on the first occasion.

In the course of the year 1861 the instruments, hitherto in use at the Flagstaff Observatory, were replaced by new ones just received from Munich, and in the month of May the necessary adjustments were so far advanced as to allow of the registration of the new instruments being commenced with the beginning of the month of June. It need scarcely be mentioned that the greatest care was taken to ensure uniformity of registration in every respect, and it is not likely that the new arrangements would have influenced the observation in any undue manner. Not satisfied, however, with such guarantees for an exact observation and discussion, I resolved to examine the anomalies of this year still further. For this purpose the lunar-diurnal variation for the period from May, 1860, to April, 1861, was derived with special regard to the moon's declination, as likewise for the same months in 1858 and 1859; and in comparing the respective results, we must remember that during both periods the same instruments were used, but still we perceive that towards the end of the latter period the abnormities above pointed out make themselves clearly manifest, even in the yearly curve with the moon's declination North and South (see Plate II.*). This seems to speak strongly in favour of a progressive change rather than of an accidental irregularity. It would be premature to enter upon an explanation of these facts at present, as it is evident that for such a purpose we are in need of similar discussions from other localities; suffice it to call attention to so important a class of phenomena. The subjoined table shows the results of this last-mentioned inquiry, and on Plate II.* are found the lunar-diurnal variation curves for the periods above delineated.

* These curves are not shown on our Plate 23; the quotations "Plate II." refer in this case to the diagram accompanying the Paper as printed in the *Philosophical Transactions*.

L UNAR-DIURNAL VARIATION OF THE MAGNETIC DECLINATION FOR THE PERIODS, MAY 1858 TO APRIL 1859,
AND MAY 1860 TO APRIL 1861.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

Declination of the		May to April.	LUNAR HOURS.											
Sun.	Moon.		0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
S. and N.	S. and N.	18 ⁵⁸ ₅	"	"	"	"	"	"	"	"	"	"	"	"
		18 ⁵⁹ ₁	+12.18	+13.37	+ 9.61	- 0.31	- 4.98	- 0.14	- 8.48	-12.63	- 2.15	+ 3.82	+ 5.84	+ 3.29
		18 ⁵⁹ ₁	+ 4.16	+ 4.57	+ 8.85	+ 4.48	- 1.35	- 2.89	-10.30	- 2.38	- 5.98	- 5.24	+ 3.45	+13.55
		18 ⁵⁹ ₁	+ 5.47	+ 9.00	+ 9.24	- 6.95	-12.02	- 2.29	-11.75	-16.39	- 7.90	+ 0.55	- 1.39	- 4.52
"	S.	18 ⁵⁹ ₁	+ 7.43	+ 5.44	+10.96	+ 8.48	- 1.85	+ 2.05	- 9.56	+ 2.35	- 7.87	+ 0.20	+ 4.49	+11.63
"	N.	18 ⁵⁹ ₁	+20.35	+18.73	+10.05	+ 7.52	+ 3.64	+ 2.46	- 4.78	- 8.42	+ 5.20	+ 7.96	+14.83	+12.41
		18 ⁵⁹ ₁	+ 0.96	+ 3.73	+ 6.73	+ 0.28	- 0.82	- 8.21	-11.08	- 7.40	- 3.95	-11.05	+ 2.30	+15.63

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

Declination of the		May to April.	LUNAR HOURS.											
Sun.	Moon.		12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
S. and N.	S. and N.	18 ⁵⁸ ₅	"	"	"	"	"	"	"	"	"	"	"	"
		18 ⁵⁹ ₁	+ 7.96	+ 1.91	— 6.94	— 4.36	—12.90	— 6.81	— 5.44	— 2.93	— 5.27	— 1.07	+ 7.85	+10.89
"	S.	18 ⁵⁹ ₁	+ 9.72	+ 4.22	+ 2.26	+ 3.65	— 2.41	— 8.83	— 4.73	— 6.67	— 6.09	— 4.66	+ 7.06	+ 5.79
		18 ⁵⁹ ₁	+ 0.93	— 9.60	— 3.69	+ 1.29	— 9.57	— 4.46	— 2.78	+ 1.66	— 9.53	— 7.30	— 2.03	+ 4.00
"	N.	18 ⁵⁹ ₁	+ 6.55	— 2.03	— 7.21	— 2.51	— 3.69	—13.38	—10.58	—10.36	—11.12	— 6.87	+ 7.21	+ 6.96
		18 ⁵⁹ ₁	+16.43	+16.40	—10.75	—10.83	—16.88	— 9.55	— 6.41	— 8.24	— 0.32	+ 6.08	+19.60	+19.51
"	N.	18 ⁶⁰ ₁	+13.13	+11.11	+12.43	+10.38	— 0.98	— 4.04	+ 1.64	— 2.89	— 0.91	— 2.42	+ 6.91	+ 4.60

On Plate II.* we represent moreover the two annual curves of the same periods without reference to the moon's declination, and we perceive that there is a depression in the curve for 1860—61 near the moon's upper transit, as likewise an increase of easterly declination near her inferior passage, while the curve for 1858—59 bears more the character of the mean curves for five years.

These few facts may for the present suffice to induce those who are engaged in similar pursuits to enter upon such a laborious task as is the classification of magnetic observations for the purpose of examining into the law and nature of the lunar-diurnal variation, according to the moon's position North or South of the equator. We may, however, rest assured that such inquiries will ultimately prove to be conducive of the greatest benefit for the advancement of the science of terrestrial magnetism; and I hope I have been successful in showing that for such a purpose it is not enough to inquire into the nature of the lunar-diurnal curve variations only for the time of the moon's farthest deviation from the equator, as has in several instances been the practice. It is, indeed, indispensable for the exact investigation of the moon's influence on the magnetism of our earth, to extend the method of inquiry, which I have just explained in the example of the magnetic declination, to the other magnetic elements, for the lunar-diurnal variation of the horizontal force also shows great differences according as the moon is to the North or the South of the equator. As far as my researches have as yet gone, I feel inclined to believe that the results in this latter case are at least equally decisive with those which I have made the immediate subject of this short paper. As soon as the respective discussions are brought to a close, I shall not fail to communicate the results of my labours in this direction to the Royal Society.

11. In addition to the tables already published on the preceding paper, I think it important to subjoin also the complete monthly tables for the lunar-diurnal variation of the magnetic declination.

* See note on preceding page.

LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION. 1858-1863.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

YEAR.	MONTHS.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858	May	-0.425	-0.363	-0.199	-0.103	-0.238	-0.184	-0.293	+0.090	-0.018	-0.149	+0.079	-0.184
	June	-0.160	+0.169	+0.026	-0.238	-0.295	-0.337	-0.137	-0.216	-0.108	+0.073	+0.115	-0.079
	July	+0.415	+0.158	+0.340	+0.232	+0.226	+0.173	-0.032	-0.257	-0.194	-0.184	-0.023	+0.161
	August	+0.095	+0.319	+0.551	+0.313	+0.569	+0.326	+0.180	-0.369	+0.054	-0.028	-0.256	-0.131
	September	-0.322	-0.539	-0.100	-0.197	-0.258	-0.145	-0.174	-0.169	+0.369	+0.238	+0.512	+0.707
	October	-0.415	-0.217	-0.391	-0.071	-0.234	-0.050	-0.167	+0.008	+0.051	-0.081	+0.041	-0.219
	November	+0.353	+0.387	-0.258	-0.260	-0.873	-0.316	-0.261	-0.750	-0.148	+0.261	+0.563	+0.889
	December	+0.514	+0.477	-0.198	-0.358	-0.068	-0.123	-0.069	-0.565	-0.593	-0.030	-0.450	-0.667
	1859 January	+0.626	+0.593	+0.350	-0.200	+0.419	+0.472	-0.333	-0.072	+0.550	+0.703	+0.443	-0.095
	February	+0.117	+0.142	+0.367	+0.230	-0.356	+0.164	+0.063	-0.364	-0.445	-0.426	+0.139	-0.293
	March	+0.712	+0.844	+0.639	+0.334	-0.075	-0.097	-0.451	-0.115	-0.038	+0.184	-0.100	+0.146
	April	+0.549	+0.490	+0.605	+0.102	+0.190	+0.010	-0.021	+0.072	+0.083	-0.137	-0.336	+0.105
1860	May	-	-	-	-	-	-	-	-	-	-	-	-
	June	-	-	-	-	-	-	-	-	-	-	-	-
	July	-0.135	+0.223	+0.563	+0.053	+0.062	+0.044	+0.176	+0.003	-0.074	0.381	-0.399	-0.395
	August	-0.483	-0.273	-0.148	+0.099	+0.152	+0.042	+0.367	+0.386	+0.015	+0.136	+0.059	+0.115
	September	+1.014	+0.930	+0.314	+0.906	+0.553	+0.275	-0.377	-0.320	-0.425	-0.275	+0.367	+0.237
	October	+0.751	+0.838	+0.484	+0.294	-0.154	-0.802	+0.214	+0.073	+0.085	+0.291	+0.297	+0.265
	November	+0.058	+0.168	-0.455	-0.318	-0.248	-0.115	-0.106	+0.099	+0.149	+0.248	+0.347	+0.419
	December	-0.022	+0.419	+0.289	+0.230	-0.091	-0.198	-0.406	-0.513	-0.701	-0.231	+0.155	+0.385
	1861 January	+0.472	+0.419	-0.087	-0.051	-0.474	-0.530	-0.907	-0.198	-0.468	+0.144	+0.670	+0.658
	February	+0.392	+0.066	-0.405	-0.431	-0.562	-0.638	-0.542	-0.377	-0.133	+0.265	+0.329	+0.328
	March	-0.010	+0.306	+0.241	+0.007	-0.277	-0.595	-0.482	-0.320	-0.322	-0.006	+0.111	-0.087
	April	-0.013	-0.220	-0.202	-0.288	-0.115	-0.288	-0.365	-0.227	-0.298	-0.227	+0.053	+0.232
1861	May	+0.114	+0.111	+0.164	+0.123	+0.017	-0.245	-0.079	-0.226	-0.476	-0.346	-0.342	+0.019
	June	+0.111	+0.033	+0.181	+0.054	-0.216	-0.107	-0.117	-0.338	-0.051	-0.210	-0.156	+0.121
	July	-0.019	+0.054	+0.392	+0.530	+0.379	+0.560	+0.106	+0.354	-0.126	-0.162	+0.051	-0.137
	August	+0.095	+0.078	-0.253	+0.056	+0.214	+0.214	+0.068	-0.178	-0.282	+0.021	+0.121	+0.087
	September	-0.100	-0.121	-0.006	+0.001	-0.142	-0.251	-0.010	-0.041	+0.103	-0.132	+0.002	+0.241
	October	+0.525	+0.484	+0.631	+0.323	+0.512	+0.262	+0.020	+0.154	-0.403	-0.483	-0.382	-0.179
	November	+0.265	+0.141	+0.488	+0.448	+0.188	+0.253	-0.049	-0.447	-0.100	-0.573	-0.220	+0.276
	December	-0.247	-0.025	+0.120	-0.320	-0.549	-0.800	-1.031	-0.219	-0.179	+0.247	+0.439	+0.788
	1862 January	+0.301	+0.308	+0.114	-0.101	-0.367	-0.393	-0.594	-0.105	-0.149	+0.039	+0.340	+0.559
	February	+0.602	+0.632	+0.675	+0.456	+0.116	-0.308	-0.576	-0.402	+0.022	-0.104	-0.103	+0.077
	March	-0.631	-0.349	-0.280	-0.344	-0.313	+0.141	+0.271	+0.396	+0.586	+0.375	+0.276	+0.151
	April	-0.402	-0.688	-0.603	-0.437	-0.205	-0.167	+0.133	+0.538	+0.046	+0.063	+0.238	+0.358
1862	May	-0.054	+0.084	-0.013	-0.644	-0.487	-0.017	-0.208	+0.064	-0.239	+0.039	+0.230	+0.215
	June	-0.071	-0.384	-0.120	-0.233	+0.122	+0.315	-0.152	-0.383	+0.036	-0.037	-0.193	+0.228
	July	-0.310	-0.574	-0.545	-0.324	+0.034	-0.068	-0.151	-0.415	-0.016	-0.068	-0.107	+0.547
	August	-0.504	-0.462	-0.136	-0.422	-0.055	+0.274	+0.064	-0.169	-0.165	-0.156	-0.095	+0.188
	September	-0.457	-0.141	-0.579	-0.524	-0.171	-0.141	+0.207	-0.202	-0.257	+0.171	+0.377	+0.240
	October	-0.203	-0.506	-0.315	-0.294	-0.217	-0.495	-0.470	-0.058	-0.120	+0.086	+0.304	+0.398
	November	-0.121	-0.103	+0.184	-0.040	-0.284	-0.173	-0.426	-0.660	-0.510	-0.221	+0.152	+0.293
	December	+0.466	+0.192	+0.183	+0.183	-0.213	-0.608	-0.467	-0.536	-0.161	-0.334	-0.157	-0.200
	1863 January	-	-	-	-	-	-	-	-	-	-	-	-
	February	+0.394	+0.518	+0.121	-0.182	-0.416	-0.512	-0.677	-0.553	-0.531	-0.269	+0.247	+0.518
	March	-0.197	+0.176	-0.175	-0.314	-0.395	-0.282	-0.309	+0.049	-0.003	-0.075	-0.092	+0.092
	April	-0.048	-0.026	-0.179	-0.284	-0.383	-0.176	-0.211	-0.165	-0.265	-0.019	-0.021	+0.178
1863	May	+0.104	-0.053	-0.042	+0.110	-0.259	-0.215	+0.147	-0.064	-0.327	-0.146	+0.007	+0.136
	June	-0.065	-0.068	-0.143	+0.134	+0.150	-0.371	-0.161	-0.269	-0.188	+0.225	-0.253	-0.256
	July	-	-	-	-	-	-	-	-	-	-	-	-
	August	-	-	-	-	-	-	-	-	-	-	-	-
	September	-0.350	-0.052	-0.385	-0.844	+0.258	-0.308	+0.476	-0.398	0.000	-0.163	+0.178	+0.241
	October	+0.205	+0.318	+0.458	+0.279	+0.064	-0.327	+0.101	-0.245	-0.331	-0.216	+0.028	-0.146
	November	+0.700	+0.472	+0.580	-0.006	-0.026	-0.504	-0.518	-0.270	-0.194	-0.012	-0.003	-0.395
	December	+0.295	+0.811	+0.412	+0.680	+0.203	-0.222	-0.323	-0.495	-0.643	-0.387	-0.154	+0.049
	1864 January	-0.264	-0.260	+0.087	-0.093	-0.376	-0.373	+0.232	-0.259	+0.254	+0.386	+1.092	+0.721
	February	+0.806	+0.764	+0.434	+0.288	-0.039	-0.332	-0.395	-0.262	-0.275	-0.018	+0.665	+0.342
		+0.094	+0.130	+0.069	-0.027	-0.095	-0.152	-0.174	-0.204	-0.142	-0.039	+0.098	+0.156

L UNAR-DIURNAL VARIATION OF THE MAGNETIC DECLINATION FOR THE PERIODS, MAY 1858 TO APRIL 1859,
AND MAY 1860 TO APRIL 1861.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

Declination of the		May to April.	LUNAR HOURS.											
Sun.	Moon.		0.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
S. and N.	S. and N.	18 ⁵⁸ ₅	"	"	"	"	"	"	"	"	"	"	"	"
		18 ⁵⁹ ₁	+12.18	+13.37	+9.61	— 0.31	— 4.98	— 0.14	— 8.48	— 12.63	— 2.15	+ 3.82	+ 5.84	+ 3.29
		18 ⁶⁰ ₁	+ 4.16	+ 4.57	+ 8.85	+ 4.48	— 1.35	— 2.89	— 10.30	— 2.38	— 5.98	— 5.24	+ 3.45	+ 13.55
		18 ⁶¹ ₁	+ 5.47	+ 9.00	+ 9.24	— 6.95	— 12.02	— 2.29	— 11.75	— 16.39	— 7.90	+ 0.55	— 1.39	— 4.52
"	S.	18 ⁵⁸ ₅	+ 7.43	+ 5.44	+ 10.96	+ 8.48	— 1.85	+ 2.05	— 9.56	+ 2.35	— 7.87	+ 0.20	+ 4.49	+ 11.63
		18 ⁵⁹ ₁	+ 20.35	+ 18.73	+ 10.05	+ 7.52	+ 3.64	+ 2.46	— 4.78	— 8.42	+ 5.20	+ 7.96	+ 14.83	+ 12.41
"	N.	18 ⁶⁰ ₁	+ 0.96	+ 3.73	+ 6.73	+ 0.28	— 0.82	— 8.21	— 11.08	— 7.40	— 3.95	— 11.05	+ 2.30	+ 15.63
		18 ⁶¹ ₁												

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

Declination of the		May to April.	LUNAR HOURS.											
Sun.	Moon.		12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.
S. and N.	S. and N.	18 ⁵⁸ ₅	"	"	"	"	"	"	"	"	"	"	"	"
		18 ⁵⁹ ₁	+ 7.96	+ 1.91	— 6.94	— 4.36	—12.90	— 6.81	— 5.44	— 2.93	— 5.27	— 1.07	+ 7.85	+10.89
		18 ⁶⁰ ₁	+ 9.72	+ 4.22	+ 2.26	+ 3.65	— 2.41	— 8.83	— 4.73	— 6.67	— 6.09	— 4.66	+ 7.06	+ 5.79
		18 ⁶¹ ₁	+ 0.93	— 9.60	— 3.69	+ 1.29	— 9.57	— 4.46	— 2.78	+ 1.66	— 9.53	— 7.30	— 2.03	+ 4.00
"	S.	18 ⁵⁸ ₅	+ 6.55	— 2.03	— 7.21	— 2.51	— 3.69	—13.38	—10.58	—10.36	—11.12	— 6.87	+ 7.21	+ 6.96
		18 ⁵⁹ ₁	+16.43	+16.40	—10.75	—10.83	—16.88	— 9.55	— 8.41	— 8.24	— 0.32	+ 6.08	+19.60	+19.51
"	N.	18 ⁶⁰ ₁	+13.13	+11.11	+12.43	+10.38	— 0.98	— 4.04	+ 1.64	— 2.89	— 0.91	— 2.42	+ 6.91	+ 4.60
		18 ⁶¹ ₁												

On Plate II.* we represent moreover the two annual curves of the same periods without reference to the moon's declination, and we perceive that there is a depression in the curve for 1860—61 near the moon's upper transit, as likewise an increase of easterly declination near her inferior passage, while the curve for 1858—59 bears more the character of the mean curves for five years.

These few facts may for the present suffice to induce those who are engaged in similar pursuits to enter upon such a laborious task as is the classification of magnetic observations for the purpose of examining into the law and nature of the lunar-diurnal variation, according to the moon's position North or South of the equator. We may, however, rest assured that such inquiries will ultimately prove to be conducive of the greatest benefit for the advancement of the science of terrestrial magnetism; and I hope I have been successful in showing that for such a purpose it is not enough to inquire into the nature of the lunar-diurnal curve variations only for the time of the moon's farthest deviation from the equator, as has in several instances been the practice. It is, indeed, indispensable for the exact investigation of the moon's influence on the magnetism of our earth, to extend the method of inquiry, which I have just explained in the example of the magnetic declination, to the other magnetic elements, for the lunar-diurnal variation of the horizontal force also shows great differences according as the moon is to the North or the South of the equator. As far as my researches have as yet gone, I feel inclined to believe that the results in this latter case are at least equally decisive with those which I have made the immediate subject of this short paper. As soon as the respective discussions are brought to a close, I shall not fail to communicate the results of my labours in this direction to the Royal Society.

11. In addition to the tables already published on the preceding paper, I think it important to subjoin also the complete monthly tables for the lunar-diurnal variation of the magnetic declination.

* See note on preceding page.

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1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

YEAR.	MONTHS.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858	May	-0.425	-0.363	-0.199	-0.103	-0.238	-0.184	-0.293	+0.090	-0.018	-0.149	+0.079	-0.184
	June	-0.160	+0.169	+0.026	-0.238	-0.295	-0.337	-0.137	-0.216	-0.108	+0.073	+0.115	-0.079
	July	+0.415	+0.158	+0.340	+0.232	+0.226	+0.173	-0.032	-0.257	-0.194	-0.184	-0.023	+0.161
	August	+0.095	+0.319	+0.551	+0.313	+0.569	+0.326	+0.180	-0.369	+0.054	-0.028	-0.256	-0.131
	September	-0.322	-0.539	-0.000	-0.197	-0.258	-0.145	-0.174	-0.169	+0.369	+0.238	+0.512	+0.707
	October	-0.415	-0.217	-0.391	-0.071	-0.284	-0.050	-0.167	+0.008	+0.051	-0.081	+0.041	-0.219
	November	+0.353	+0.387	-0.258	-0.260	-0.873	-0.516	0.261	-0.750	-0.148	+0.261	+0.563	+0.889
	December	+0.514	+0.477	-0.198	-0.358	-0.068	-0.123	-0.069	-0.565	-0.593	-0.030	-0.450	-0.667
	1859 January	+0.626	+0.593	+0.350	-0.200	+0.419	+0.472	-0.333	-0.072	+0.550	+0.703	+0.443	-0.095
	February	+0.117	+0.142	+0.367	+0.230	-0.356	+0.164	+0.063	-0.364	-0.445	-0.426	+0.139	-0.293
	March	+0.712	+0.844	+0.639	+0.334	-0.075	-0.097	-0.451	-0.115	0.038	+0.184	-0.100	+0.146
	April	+0.549	+0.490	+0.605	+0.102	+0.190	+0.010	-0.021	+0.072	+0.083	-0.137	-0.336	+0.105
1860	May	—	—	—	—	—	—	—	—	—	—	—	—
	June	—	—	—	—	—	—	—	—	—	—	—	—
	July	-0.135	+0.223	+0.568	+0.053	+0.062	+0.044	+0.176	+0.003	-0.074	0.381	-0.399	-0.395
	August	-0.488	-0.273	-0.148	+0.099	+0.152	+0.042	+0.367	+0.386	+0.015	+0.136	+0.059	+0.115
	September	+1.014	+0.930	+0.314	+0.906	+0.553	+0.275	-0.377	-0.320	-0.425	-0.275	+0.367	+0.237
	October	+0.751	+0.838	+0.484	+0.294	-0.154	-0.802	+0.214	+0.073	+0.085	+0.291	+0.297	+0.265
	November	+0.058	+0.168	-0.455	-0.318	-0.248	-0.115	-0.106	+0.099	+0.149	+0.248	+0.347	+0.419
	December	-0.022	+0.419	+0.289	+0.230	-0.091	-0.198	-0.406	-0.513	-0.701	-0.231	+0.155	+0.385
	1861 January	+0.472	+0.419	-0.087	-0.051	-0.474	-0.530	-0.907	-0.198	-0.468	+0.144	+0.670	+0.658
	February	+0.392	+0.066	-0.405	-0.431	-0.562	-0.638	-0.542	-0.377	-0.133	+0.265	+0.329	+0.328
	March	-0.010	+0.306	+0.241	+0.007	-0.277	-0.595	-0.482	-0.320	-0.322	-0.006	+0.111	-0.087
	April	-0.013	-0.220	-0.202	-0.288	-0.115	-0.288	-0.365	-0.227	-0.298	-0.227	+0.053	+0.232
1861	May	+0.114	+0.111	+0.164	+0.123	+0.017	-0.245	-0.079	-0.226	-0.476	-0.346	-0.342	+0.019
	June	+0.111	+0.033	+0.181	+0.054	-0.216	+0.107	-0.117	-0.338	-0.051	-0.210	-0.156	+0.121
	July	-0.019	+0.054	+0.392	+0.530	+0.379	+0.560	+0.106	+0.354	-0.126	-0.162	+0.051	-0.137
	August	+0.095	+0.078	-0.253	-0.056	+0.214	+0.214	+0.068	-0.178	-0.282	+0.021	+0.121	+0.087
	September	-0.100	-0.121	-0.006	+0.001	-0.142	-0.251	-0.010	-0.041	+0.103	-0.132	+0.002	+0.241
	October	+0.525	+0.484	+0.631	+0.323	+0.512	+0.262	+0.020	+0.154	-0.403	-0.483	-0.382	-0.179
	November	+0.265	+0.141	+0.488	+0.448	+0.188	+0.253	-0.049	-0.447	-0.100	-0.573	-0.220	+0.276
	December	-0.247	-0.025	+0.120	-0.320	-0.549	-0.800	-1.031	-0.219	-0.179	+0.247	+0.439	+0.788
	1862 January	+0.301	+0.308	+0.114	-0.101	-0.367	-0.393	-0.594	-0.105	-0.149	+0.039	+0.340	+0.559
	February	+0.602	+0.632	+0.675	+0.416	+0.116	-0.308	-0.576	-0.402	+0.022	-0.104	-0.103	+0.077
	March	-0.681	-0.349	-0.280	-0.344	-0.313	+0.141	+0.271	+0.396	+0.586	+0.375	+0.276	+0.151
	April	-0.402	-0.688	-0.603	-0.437	-0.205	-0.167	+0.133	+0.538	+0.046	+0.063	+0.238	+0.358
1862	May	-0.054	+0.084	-0.013	-0.644	-0.487	-0.017	-0.208	+0.064	-0.239	+0.039	+0.230	+0.215
	June	-0.071	-0.384	-0.120	-0.233	+0.122	+0.315	-0.152	-0.383	+0.036	-0.037	-0.193	+0.228
	July	-0.310	-0.374	-0.545	-0.324	+0.054	-0.068	-0.151	-0.415	-0.016	-0.068	-0.107	+0.547
	August	-0.504	-0.462	-0.136	-0.422	-0.055	+0.274	+0.064	-0.169	-0.165	-0.156	-0.095	+0.188
	September	-0.457	-0.141	-0.579	-0.524	-0.171	-0.141	+0.207	-0.202	-0.257	+0.171	+0.377	+0.240
	October	-0.203	-0.506	-0.315	-0.294	-0.217	-0.495	-0.470	-0.058	-0.120	+0.086	+0.304	+0.398
	November	-0.121	-0.103	+0.184	-0.040	-0.284	-0.173	-0.426	-0.660	-0.510	-0.221	+0.152	+0.293
	December	+0.466	+0.192	+0.183	+0.183	-0.213	-0.608	-0.467	-0.536	-0.161	-0.334	-0.157	-0.200
	1863 January	—	—	—	—	—	—	—	—	—	—	—	—
	February	+0.394	+0.518	+0.121	-0.182	-0.416	-0.512	-0.677	-0.553	-0.531	-0.269	+0.247	+0.518
	March	-0.197	+0.176	-0.175	-0.314	-0.395	-0.282	-0.309	+0.049	-0.003	-0.075	-0.092	+0.092
	April	-0.048	-0.026	-0.179	-0.284	-0.383	-0.176	-0.211	-0.165	-0.265	-0.019	-0.021	+0.178
	May	+0.104	-0.053	-0.042	+0.110	-0.259	-0.215	+0.147	-0.064	-0.327	-0.146	+0.007	+0.136
	June	-0.065	-0.068	-0.143	+0.134	+0.150	-0.371	-0.161	-0.269	-0.188	+0.225	-0.253	-0.256
	July	—	—	—	—	—	—	—	—	—	—	—	—
	August	—	—	—	—	—	—	—	—	—	—	—	—
	September	-0.350	-0.052	-0.385	-0.844	+0.258	-0.308	+0.476	-0.398	0.000	-0.163	+0.178	+0.241
	October	+0.205	+0.318	+0.458	+0.279	+0.064	-0.327	+0.101	-0.245	-0.331	-0.216	+0.028	-0.146
	November	+0.700	+0.472	+0.580	-0.006	-0.026	-0.504	-0.518	-0.270	-0.194	-0.012	-0.003	-0.395
	December	+0.295	+0.811	+0.412	+0.680	+0.203	-0.222	-0.323	-0.495	-0.643	-0.387	-0.154	+0.049
1863	January	-0.264	-0.260	+0.087	-0.093	-0.376	-0.373	+0.232	-0.259	+0.254	+0.386	+1.092	+0.721
	February	+0.806	+0.764	+0.434	+0.288	-0.039	-0.332	-0.395	-0.262	-0.275	-0.018	+0.665	+0.342
		+0.094	+0.130	+0.069	-0.027	-0.095	-0.152	-0.174	-0.204	-0.142	-0.039	+0.098	+0.156

LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION 1858-1863.

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

YEAR.	MONTHS.	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
1858	May	-0.029	+0.152	-0.102	-0.060	-0.362	+0.123	+0.137	+0.296	+0.260	-0.127	-0.010	-0.095
	June	+0.172	+0.208	-0.005	+0.007	+0.047	+0.318	+0.143	+0.233	-0.131	+0.039	-0.042	-0.038
	July	+0.066	-0.234	+0.009	-0.054	-0.127	-0.289	+0.138	+0.253	-0.204	-0.111	-0.027	-0.163
	August	-0.291	-0.119	-0.333	-0.137	-0.118	-0.082	-0.171	-0.187	-0.051	-0.116	+0.139	+0.089
	September	+0.686	+0.492	-0.009	+0.038	-0.363	-0.293	-0.437	-0.263	-0.349	-0.046	+0.200	+0.200
	October	+0.496	+0.262	-0.107	+0.079	+0.097	+0.184	+0.095	-0.160	-0.075	+0.135	+0.180	+0.185
	November	+0.205	+0.296	-0.153	+0.044	-0.395	-0.350	-0.329	+0.035	-0.004	+0.037	+0.026	+0.338
	December	-0.018	+0.350	+0.475	+0.216	+0.342	+0.283	-0.374	-0.320	+0.010	-0.185	+0.291	+0.488
1859	January	-0.091	-0.372	-0.378	-0.692	-0.427	-0.557	-0.668	-0.220	-0.372	+0.371	+0.211	+0.119
	February	+0.317	+0.065	+0.091	+0.083	-0.224	+0.545	+0.645	+0.512	+0.089	-0.508	-0.208	+0.121
	March	+0.083	-0.316	-0.617	-0.089	-0.157	-0.711	-0.768	-0.638	-0.124	+0.303	+0.532	+0.601
	April	-0.172	-0.136	-0.277	-0.460	-0.529	-0.540	-0.125	-0.239	-0.393	+0.157	+0.581	+0.462
	May	—	—	—	—	—	—	—	—	—	—	—	—
	June	—	—	—	—	—	—	—	—	—	—	—	—
	July	-0.020	+0.165	+0.327	+0.424	+0.277	+0.120	-0.042	+0.360	-0.447	-0.362	-0.237	-0.257
	August	-0.145	-0.589	+0.453	+0.790	+0.512	+0.704	-0.067	+0.423	-0.443	-0.844	-0.313	-0.219
	September	+0.235	+0.150	+0.020	-0.993	-0.098	-0.579	-0.384	-0.861	-0.253	-0.840	-0.278	+0.078
	October	+0.330	+0.202	-0.228	-0.400	-0.269	-0.239	-0.357	-0.480	-0.429	-0.275	+0.115	+0.325
	November	+0.664	+0.610	+0.348	-0.065	-0.297	-0.510	-0.480	-0.090	-0.241	-0.129	+0.064	-0.026
	December	+0.288	+0.532	+0.825	+0.147	+0.423	-0.291	-0.177	-0.691	-0.535	-0.416	-0.674	-0.519
1860	January	+0.868	+1.004	+0.376	-0.321	-0.157	-0.613	-0.334	-0.567	-0.788	+0.278	+0.798	+0.589
	February	+0.238	+0.485	+0.334	+0.053	+0.075	-0.417	+0.110	-0.216	+0.076	+0.167	+0.135	+0.253
	March	-0.250	-0.370	+0.139	+0.027	+0.309	+0.034	+0.269	-0.078	+0.216	+0.402	+0.210	+0.276
	April	+0.193	+0.036	-0.229	+0.022	+0.044	-0.091	+0.444	+0.056	+0.254	+0.527	+0.726	+0.615
	May	-0.208	-0.293	+0.170	+0.375	+0.032	+0.071	+0.139	+0.110	+0.328	+0.068	+0.294	+0.039
	June	-0.356	-0.369	-0.014	-0.151	-0.124	+0.054	+0.253	+0.293	+0.157	+0.292	+0.189	+0.145
	July	-0.247	-0.378	-0.483	-0.676	-0.602	-0.431	+0.005	+0.173	+0.107	+0.212	+0.187	+0.149
	August	-0.022	-0.038	-0.253	-0.085	-0.292	+0.103	+0.043	+0.077	+0.040	+0.196	+0.188	+0.343
	September	+0.234	+0.193	-0.010	+0.053	+0.091	+0.044	+0.003	-0.002	-0.042	-0.062	+0.115	+0.100
	October	-0.269	-0.210	+0.075	+0.012	+0.001	-0.083	+0.050	-0.252	-0.264	-0.626	-0.180	+0.141
	November	+0.049	-0.064	-0.290	+0.148	+0.437	+0.076	+0.186	-0.134	-0.430	-0.324	-0.153	-0.062
	December	+0.857	+0.447	+0.600	+0.279	-0.074	-0.412	-0.136	-0.499	-0.026	-0.131	+0.433	+0.428
1861	January	+0.874	+0.587	+0.461	+0.281	-0.100	-0.484	-0.518	-0.562	-0.468	-0.451	+0.143	+0.299
	February	+0.070	+0.032	-0.275	-0.310	-0.414	-0.372	-0.141	-0.122	-0.278	+0.018	+0.148	+0.428
	March	+0.132	+0.472	+0.182	+0.271	+0.098	-0.193	-0.498	-0.419	-0.370	-0.016	+0.323	-0.340
	April	+0.428	+0.370	+0.438	+0.419	+0.252	-0.290	-0.367	-0.212	-0.182	-0.127	-0.387	-0.599
	May	+0.190	+0.145	+0.504	+0.408	+0.440	+0.305	-0.219	+0.001	-0.309	-0.711	-0.031	-0.293
	June	+0.370	-0.319	+0.063	+0.173	+0.085	+0.040	+0.313	+0.271	+0.100	-0.119	-0.164	-0.069
	July	+0.509	+0.616	+0.209	+0.063	+0.086	+0.263	+0.168	+0.128	-0.333	-0.294	-0.253	-0.343
	August	+0.116	+0.575	+0.525	+0.393	+0.330	+0.088	+0.156	+0.165	+0.080	-0.375	-0.296	-0.245
	September	+0.483	+0.423	+0.284	+0.228	+0.048	+0.187	+0.051	+0.418	-0.020	+0.010	+0.078	+0.065
	October	+0.665	+0.514	+0.456	+0.497	+0.370	+0.300	+0.098	-0.041	-0.171	-0.065	-0.446	-0.151
	November	+0.323	+0.051	+0.294	+0.218	-0.017	+0.241	-0.094	+0.149	+0.039	+0.315	+0.169	+0.245
	December	+0.370	+0.370	+0.649	+0.333	+0.212	+0.419	+0.028	-0.266	-0.339	-0.369	-0.020	+0.372
1862	January	—	—	—	—	—	—	—	—	—	—	—	—
	February	+0.471	+0.374	+0.571	+0.075	-0.279	-0.358	-0.041	+0.114	-0.521	+0.016	+0.487	+0.490
	March	-0.013	+0.132	+0.017	-0.134	-0.466	-0.584	-0.563	-0.465	-0.137	+0.018	-0.051	+0.244
	April	+0.372	+0.267	+0.139	-0.233	-0.234	-0.076	-0.152	-0.003	+0.017	+0.042	+1.065	+0.081
	May	+0.158	+0.022	-0.123	-0.117	-0.123	-0.056	-0.017	-0.286	+0.018	-0.081	-0.040	-0.054
	June	-0.288	+0.251	+0.095	+0.276	+0.189	-0.241	-0.292	-0.013	-0.146	-0.356	-0.432	-0.101
	July	—	—	—	—	—	—	—	—	—	—	—	—
	August	—	—	—	—	—	—	—	—	—	—	—	—
	September	-0.528	+0.197	+0.438	+0.248	-0.638	+0.405	+0.046	+0.009	+0.356	-0.263	+0.003	+0.587
	October	-0.337	+0.087	-0.079	+0.242	-0.364	-0.362	-0.072	+0.030	-0.305	+0.100	-0.139	+0.144
	November	-0.246	+0.015	+0.024	-0.124	-0.065	-0.354	-0.557	-0.459	-0.050	+0.511	+0.432	+0.221
	December	+0.412	+0.634	+0.300	+0.101	-0.057	-0.289	-0.254	-0.531	-0.475	-0.365	-0.142	+0.156
1863	January	+0.717	+0.423	-0.245	-0.565	-0.636	-0.392	-0.663	-0.422	+0.402	-0.043	+0.137	-0.333
	February	+0.315	+0.741	+0.402	+0.200	-0.349	-0.771	-0.642	-0.749	-0.446	-0.828	-0.346	+0.092
		+0.178	+0.171	+0.115	+0.029	-0.067	-0.122	-0.118	-0.123	-0.142	-0.105	+0.066	+0.106

III. MAGNETIC HORIZONTAL FORCE.

HOURLY OBSERVATIONS.

12. As already mentioned in the Introduction, the instrument for measuring the horizontal component of the magnetic force had, according to Professor Lamont's construction, an arrangement for compensating the effects of temperature upon the two deflecting magnets used in this system of instruments. Both the magnets of deflection and compensation had, in the set of instruments first used (up to June, 1861), the shape of rhombi, while in the instruments subsequently employed, the vertical and longitudinal sections were rectangles. In setting the instrument for measuring the horizontal force, particular care was employed, that the effect of the deflecting magnets should be exactly equal, *i.e.*, that the angle of deflection (ϕ) should be a minimum.

Looking from the scales towards the magnets, the magnetometer was placed in each case (in the old Horary House, the old Absolute House, and the new Horary House) to the right of the declinometer, the distance of the forepart of the scale from the mirror of the magnetometer being in each case the same as the respective distances in the declinometer.

From several measurements the distances of the declinometer from the magnetometer, and of both of these from the centre of the stand of the tubes, were found to be respectively 60.10 in. and 68.36 in., thus giving an angle of deflection $\phi = 52^\circ 9'.3$. This applies to the Old Observatory, and the period from the 1st of May, 1858, to the end of June, 1862. During the short time the observations were made in the old Absolute House (July, August, and September, 1862), the distances of the declinometer from the magnetometer, and of both of these from the centre of the stand of the tubes, were respectively 62.0 in. and 70.75 in., from which the angle of deflection was found to be $\phi = 51^\circ 58'.4$. In the Horary House of the New Observatory from the 1st of October, 1862, to the end of February, 1863, these distances were 62.57 in. and 69.71 in., and consequently the angle of deflection $\phi = 53^\circ 19'.75$. The angles of deflection for the various periods were also determined by the aid of deflecting magnets and small deflectors, in the manner suggested in Professor Lamont's writings. The results were found to agree well with those above given; but as, in the subsequent determination of the value of a part of division, only the trigonometrically obtained values will be employed, I refrain from adding the others here.

What was said when speaking of the hourly observations on the magnetic declination, applies also with respect to the sense in which the scale of the instrument for measuring the horizontal force was divided. Subsequent to the 20th of October, 1860, the numbering of the scale was in the opposite direction; and if D denote the reading of the declinometer, H that of the instrument for the horizontal force, the actual reading of the latter (n') was, previous to the above date, $D - H$, and subsequently $H - D$, causing thereby the actual readings of the instruments to run in the same sense, namely, in such a manner, *that an increase in the readings corresponds with an increase in the magnetic horizontal force, and vice versa.*

The further treatment of the original observations, in order to obtain the subjoined tables, will be explained hereafter.

LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION 1858-1863.

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

YEAR.	MONTHS.	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
1858	May	-0.029	+0.152	-0.102	-0.060	-0.362	+0.123	+0.137	+0.296	+0.260	-0.127	-0.010	-0.095
	June	+0.172	+0.208	-0.005	+0.007	+0.047	+0.318	+0.143	+0.233	-0.131	+0.039	-0.042	-0.038
	July	+0.066	-0.234	+0.009	-0.054	-0.127	-0.289	+0.138	+0.253	-0.204	-0.111	-0.027	-0.163
	August	-0.291	-0.119	-0.333	-0.137	-0.118	-0.082	-0.171	-0.187	-0.051	-0.116	+0.139	+0.089
	September	+0.686	+0.492	-0.009	+0.038	-0.363	-0.293	-0.293	-0.437	-0.263	-0.349	-0.046	+0.200
	October	+0.496	+0.262	-0.107	+0.079	+0.097	+0.184	+0.095	-0.160	-0.075	+0.135	+0.180	+0.185
	November	+0.205	+0.296	-0.153	+0.044	-0.395	-0.350	-0.329	+0.035	-0.004	+0.087	+0.026	+0.338
	December	-0.018	+0.350	+0.475	+0.216	+0.342	+0.283	-0.374	-0.320	+0.010	-0.185	+0.291	+0.488
	1859 January	-0.091	-0.372	-0.378	-0.692	-0.427	-0.557	-0.668	-0.220	-0.372	+0.371	+0.211	+0.119
	February	+0.317	+0.065	+0.091	+0.083	-0.224	+0.545	+0.645	+0.512	+0.089	-0.508	-0.208	+0.121
	March	+0.083	-0.316	-0.617	-0.089	-0.157	-0.711	-0.768	-0.638	-0.124	+0.303	+0.532	+0.601
	April	-0.172	-0.136	-0.277	-0.460	-0.529	-0.540	-0.125	-0.239	-0.393	+0.157	+0.581	+0.462
1860	May	—	—	—	—	—	—	—	—	—	—	—	—
	June	—	—	—	—	—	—	—	—	—	—	—	—
	July	-0.020	+0.165	+0.327	+0.424	+0.277	+0.120	-0.042	+0.360	-0.447	-0.362	-0.237	-0.257
	August	-0.145	-0.589	+0.453	+0.790	+0.512	+0.704	-0.067	+0.423	-0.443	-0.844	-0.313	-0.219
	September	+0.235	+0.150	+0.020	-0.993	-0.098	-0.579	-0.384	-0.861	-0.253	-0.840	-0.278	+0.078
	October	+0.330	+0.202	-0.228	-0.400	-0.269	-0.239	-0.357	-0.480	-0.429	-0.275	+0.115	+0.325
	November	+0.664	+0.610	+0.348	-0.065	-0.297	-0.510	-0.480	-0.090	-0.241	-0.129	+0.064	-0.026
	December	+0.288	+0.532	+0.825	+0.147	+0.423	-0.291	-0.177	-0.691	-0.535	-0.416	-0.674	-0.519
	1861 January	+0.868	+1.004	+0.376	-0.321	-0.157	-0.613	-0.334	-0.567	-0.788	+0.278	+0.798	+0.589
	February	+0.238	+0.485	+0.334	+0.053	+0.075	-0.417	+0.110	-0.216	+0.076	+0.167	+0.135	+0.253
	March	-0.250	-0.370	+0.139	+0.027	+0.309	+0.034	+0.269	-0.078	+0.216	+0.402	+0.210	+0.276
	April	+0.193	+0.086	-0.229	+0.022	+0.044	-0.091	+0.444	+0.056	+0.254	+0.527	+0.726	+0.615
1862	May	-0.208	-0.293	+0.170	+0.375	+0.032	+0.071	+0.139	+0.110	+0.328	+0.068	+0.294	+0.039
	June	-0.356	-0.369	-0.014	-0.151	-0.124	+0.054	+0.253	+0.293	+0.157	+0.292	+0.189	+0.145
	July	-0.247	-0.378	-0.483	-0.676	-0.602	-0.431	+0.005	+0.173	+0.107	+0.212	+0.187	+0.149
	August	-0.022	-0.038	-0.253	-0.085	-0.292	+0.103	+0.043	+0.077	+0.040	+0.196	+0.188	+0.343
	September	+0.234	+0.193	-0.010	+0.053	+0.091	+0.044	+0.006	-0.002	-0.042	-0.062	+0.115	+0.100
	October	-0.269	-0.210	+0.075	+0.012	+0.001	-0.083	+0.050	-0.252	-0.264	-0.626	-0.180	+0.141
	November	+0.049	-0.064	-0.290	+0.148	+0.437	+0.076	+0.186	-0.134	-0.430	-0.324	-0.153	-0.062
	December	+0.857	+0.447	+0.600	+0.279	-0.074	-0.412	-0.136	-0.499	-0.026	-0.131	+0.433	+0.428
	1863 January	+0.874	+0.587	+0.461	+0.281	-0.100	-0.484	-0.518	-0.562	-0.468	-0.451	+0.143	+0.299
	February	+0.070	+0.032	-0.275	-0.310	-0.414	-0.372	-0.141	-0.122	-0.278	+0.018	+0.148	+0.428
	March	+0.132	+0.472	+0.182	+0.271	+0.098	-0.193	-0.498	-0.419	-0.370	-0.016	+0.323	-0.340
	April	+0.428	+0.370	+0.438	+0.419	+0.252	-0.290	-0.367	-0.212	-0.182	-0.127	-0.387	-0.599
1863	May	+0.190	+0.145	+0.504	+0.408	+0.440	+0.305	-0.219	+0.001	-0.309	-0.711	-0.031	-0.293
	June	+0.370	-0.319	+0.065	+0.173	+0.085	+0.040	+0.313	+0.271	+0.100	-0.119	-0.164	-0.069
	July	+0.509	+0.616	+0.209	+0.063	+0.086	+0.263	+0.168	+0.128	-0.333	-0.294	-0.253	-0.343
	August	+0.116	+0.575	+0.525	+0.393	+0.330	+0.088	+0.156	+0.165	+0.080	-0.375	-0.296	-0.245
	September	+0.483	+0.423	+0.284	+0.228	+0.048	+0.187	+0.051	+0.418	-0.020	+0.010	+0.078	+0.065
	October	+0.665	+0.514	+0.456	+0.497	+0.370	+0.300	+0.098	-0.041	-0.171	-0.065	-0.446	-0.151
	November	+0.323	+0.051	+0.294	+0.218	-0.017	+0.241	-0.094	+0.149	+0.039	+0.315	+0.169	+0.245
	December	+0.370	+0.370	+0.649	+0.333	+0.212	+0.419	+0.028	-0.266	-0.339	-0.369	-0.020	+0.372
	1864 January	—	—	—	—	—	—	—	—	—	—	—	—
	February	+0.471	+0.374	+0.571	+0.075	-0.279	-0.358	-0.041	+0.114	-0.521	+0.016	+0.487	+0.490
	March	-0.013	+0.132	+0.017	-0.134	-0.466	-0.584	-0.563	-0.465	-0.137	+0.018	-0.051	+0.244
	April	+0.372	+0.267	+0.139	-0.233	-0.234	-0.076	-0.152	-0.003	+0.017	+0.042	+1.065	+0.081
	May	+0.158	+0.022	-0.123	-0.117	-0.123	-0.056	-0.017	-0.286	+0.018	-0.081	-0.040	-0.054
	June	-0.288	+0.251	+0.095	+0.276	+0.189	-0.241	-0.292	-0.013	-0.146	-0.356	-0.432	-0.101
	July	—	—	—	—	—	—	—	—	—	—	—	—
	August	—	—	—	—	—	—	—	—	—	—	—	—
	September	-0.528	+0.197	+0.438	+0.248	-0.638	+0.405	+0.046	+0.009	+0.356	-0.263	+0.003	+0.587
	October	-0.337	+0.087	-0.079	+0.242	-0.364	-0.362	-0.072	+0.030	-0.305	+0.100	-0.139	+0.144
	November	-0.246	+0.015	+0.024	-0.124	-0.065	-0.354	-0.557	-0.459	-0.050	+0.511	+0.432	+0.221
	December	+0.412	+0.634	+0.300	+0.101	-0.057	-0.289	-0.254	-0.531	-0.475	-0.365	-0.142	+0.156
	1865 January	+0.717	+0.423	-0.245	-0.565	-0.636	-0.392	-0.663	-0.422	+0.402	-0.043	+0.137	-0.333
	February	+0.315	+0.741	+0.402	+0.200	-0.349	-0.771	-0.642	-0.749	-0.446	-0.828	-0.346	+0.092
		+0.178	+0.171	+0.115	+0.029	-0.067	-0.122	-0.118	-0.123	-0.142	-0.105	+0.066	+0.106

III. MAGNETIC HORIZONTAL FORCE.

HOURLY OBSERVATIONS.

12. As already mentioned in the Introduction, the instrument for measuring the horizontal component of the magnetic force had, according to Professor Lamont's construction, an arrangement for compensating the effects of temperature upon the two deflecting magnets used in this system of instruments. Both the magnets of deflection and compensation had, in the set of instruments first used (up to June, 1861), the shape of rhombi, while in the instruments subsequently employed, the vertical and longitudinal sections were rectangles. In setting the instrument for measuring the horizontal force, particular care was employed, that the effect of the deflecting magnets should be exactly equal, *i.e.*, that the angle of deflection (ϕ) should be a minimum.

Looking from the scales towards the magnets, the magnetometer was placed in each case (in the old Horary House, the old Absolute House, and the new Horary House) to the right of the declinometer, the distance of the forepart of the scale from the mirror of the magnetometer being in each case the same as the respective distances in the declinometer.

From several measurements the distances of the declinometer from the magnetometer, and of both of these from the centre of the stand of the tubes, were found to be respectively 60.10 in. and 68.36 in., thus giving an angle of deflection $\phi = 52^\circ 9' 3''$. This applies to the Old Observatory, and the period from the 1st of May, 1858, to the end of June, 1862. During the short time the observations were made in the old Absolute House (July, August, and September, 1862), the distances of the declinometer from the magnetometer, and of both of these from the centre of the stand of the tubes, were respectively 62.0 in. and 70.75 in., from which the angle of deflection was found to be $\phi = 51^\circ 58' 4''$. In the Horary House of the New Observatory from the 1st of October, 1862, to the end of February, 1863, these distances were 62.57 in. and 69.71 in., and consequently the angle of deflection $\phi = 53^\circ 19' 75''$. The angles of deflection for the various periods were also determined by the aid of deflecting magnets and small deflectors, in the manner suggested in Professor Lamont's writings. The results were found to agree well with those above given; but as, in the subsequent determination of the value of a part of division, only the trigonometrically obtained values will be employed, I refrain from adding the others here.

What was said when speaking of the hourly observations on the magnetic declination, applies also with respect to the sense in which the scale of the instrument for measuring the horizontal force was divided. Subsequent to the 20th of October, 1860, the numbering of the scale was in the opposite direction; and if D denote the reading of the declinometer, H that of the instrument for the horizontal force, the actual reading of the latter (n') was, previous to the above date, $D - H$, and subsequently $H - D$, causing thereby the actual readings of the instruments to run in the same sense, namely, in such a manner, *that an increase in the readings corresponds with an increase in the magnetic horizontal force, and vice versa.*

The further treatment of the original observations, in order to obtain the subjoined tables, will be explained hereafter.

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MAY 1858.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.4	+ 0.9	+ 2.2	+ 1.7	+ 1.8	+ 2.0	+ 2.2	+ 3.3	+ 1.9	+ 1.0	- 0.2	- 0.9	- 1.1	- 0.9	- 0.7	+ 1.1	+ 2.2	+ 3.1	+ 3.6	+ 1.9	+ 1.5	+ 3.9	+ 3.8	+ 3.1
2d	+ 2.8	+ 4.2	+ 2.4	+ 3.0	+ 1.4	+ 0.2	+ 4.0	+ 3.2	+ 2.5	+ 1.7	+ 1.3	+ 0.4	- 0.2	- 0.5	- 3.5	- 0.7	+ 1.2	+ 2.6	+ 3.1	+ 3.2	+ 3.3	+ 3.9	+ 3.5	+ 3.2
3d	+ 3.9	+ 3.1	+ 3.2	+ 4.0	+ 4.8	+ 5.4	+ 4.4	+ 4.5	+ 4.3	+ 4.6	+ 4.4	+ 4.5	+ 4.1	+ 2.3	- 1.4	+ 1.8	+ 2.9	+ 4.3	+ 5.0	+ 5.0	+ 4.9	+ 5.2	+ 5.5	+ 6.2
4th	+ 4.8	+ 4.9	+ 4.7	+ 5.3	+ 4.1	+ 3.5	+ 3.1	+ 4.6	+ 3.6	+ 3.5	+ 3.3	+ 1.8	+ 0.7	- 0.4	+ 0.5	+ 2.9	+ 2.7	+ 3.7	+ 2.7	+ 3.1	+ 5.0	+ 4.7	+ 4.9	+ 4.5
5th	+ 4.7	+ 4.3	+ 4.9	+ 5.5	+ 5.6	+ 5.6	+ 6.8	-	+ 7.5	+ 6.8	+ 3.8	+ 1.8	+ 0.7	+ 0.3	+ 0.9	+ 2.4	+ 4.5	+ 2.9	+ 3.8	+ 4.4	+ 4.3	+ 4.5	+ 4.3	+ 4.0
6th	+ 4.3	+ 4.6	+ 4.8	+ 5.3	+ 5.6	+ 6.0	+ 5.8	+ 5.8	+ 6.9	+ 6.2	+ 4.6	+ 3.7	+ 1.8	+ 2.0	+ 2.9	+ 3.4	+ 3.5	+ 3.9	+ 4.1	+ 3.0	+ 3.5	+ 5.0	+ 5.1	+ 4.9
7th	+ 5.4	+ 4.9	+ 3.7	+ 3.1	-	+ 5.6	+ 5.3	+ 5.7	+ 5.6	+ 4.7	+ 5.6	+ 3.9	+ 4.2	+ 4.7	- 4.1	+ 4.6	+ 5.2	+ 5.2	+ 5.2	+ 5.8	+ 6.3	+ 6.2	+ 5.4	+ 5.3
8th	+ 5.4	+ 5.9	+ 6.6	+ 7.3	+ 8.4	+ 9.3	+ 7.4	+ 4.5	+ 9.3	+ 3.1	- 8.2	- 13.7	- 12.7	- 9.6	- 11.6	- 11.1	- 14.5	- 13.8	- 12.1	- 17.8	- 5.2	- 7.8	- 7.5	+ 8.5
9th	- 5.2	- 7.0	- 0.6	- 2.6	- 1.7	- 3.9	- 1.2	- 1.0	- 3.1	- 6.5	- 15.1	- 13.3	- 15.0	- 16.7	- 10.9	- 14.2	- 7.9	- 22.5	- 5.8	- 3.4	- 3.6	- 4.5	- 3.2	- 5.4
10th	+ 2.5	- 1.6	- 0.9	- 1.6	- 1.7	- 1.8	- 0.3	- 0.9	- 8.9	- 5.2	- 5.1	- 5.2	- 5.2	- 10.5	- 8.8	- 12.1	- 7.2	- 4.2	- 2.3	+ 2.3	- 1.7	- 3.4	0.0	+ 7.7
11th	- 7.8	- 0.7	- 0.6	+ 1.0	+ 0.1	+ 2.0	+ 1.4	+ 0.6	+ 0.8	- 1.3	- 2.8	- 0.6	- 1.6	- 5.7	- 8.1	- 6.6	- 6.4	- 3.1	- 1.2	+ 0.1	- 0.2	+ 0.9	+ 0.1	+ 1.1
12th	+ 0.6	+ 5.0	+ 2.3	+ 0.9	+ 1.0	- 0.7	+ 1.8	+ 3.5	+ 0.2	- 2.8	- 0.1	- 2.9	- 5.2	- 4.5	- 3.9	- 3.9	- 2.8	- 0.8	+ 0.2	- 0.2	+ 1.9	+ 0.8	+ 0.6	+ 1.0
13th	+ 0.4	+ 3.2	+ 2.2	+ 1.4	+ 2.1	+ 3.3	+ 3.6	+ 2.2	+ 2.5	+ 1.3	- 1.7	- 3.1	- 5.0	- 4.0	- 4.1	- 2.4	- 0.9	+ 0.3	- 2.8	0.0	+ 2.0	+ 2.4	+ 1.5	+ 1.1
14th	+ 0.4	+ 0.8	+ 1.2	+ 0.5	+ 2.0	+ 2.5	+ 1.4	+ 3.2	+ 2.9	+ 0.7	- 5.1	- 3.8	- 5.5	- 4.5	- 3.9	- 1.1	+ 0.3	+ 1.2	+ 1.2	+ 1.8	+ 2.1	+ 1.1	+ 1.6	+ 2.2
15th	+ 0.6	+ 4.0	+ 1.6	+ 1.6	+ 0.6	+ 1.7	+ 3.0	+ 3.6	+ 4.0	+ 3.8	+ 2.8	- 2.0	- 1.5	- 2.5	- 2.0	- 1.1	+ 0.2	+ 1.7	+ 1.7	+ 1.6	+ 2.2	+ 2.2	+ 2.4	+ 2.6
16th	+ 6.5	+ 3.2	+ 3.9	+ 3.6	+ 3.5	-	+ 3.5	+ 5.3	+ 6.4	+ 6.0	+ 6.1	+ 5.0	+ 4.0	+ 3.1	+ 2.3	+ 2.4	+ 2.5	+ 2.5	- 0.1	- 0.2	+ 1.9	+ 3.3	+ 3.3	+ 2.9
17th	+ 3.0	+ 2.9	+ 3.7	+ 4.4	+ 4.8	+ 4.6	+ 5.0	+ 5.8	+ 7.8	+ 6.7	+ 4.8	+ 2.2	+ 4.6	+ 2.8	- 2.3	- 3.0	- 1.9	- 4.2	+ 0.7	+ 2.5	+ 2.6	+ 0.5	- 0.8	- 0.4
18th	+ 3.0	+ 3.2	+ 2.6	+ 6.0	+ 5.8	+ 4.4	+ 3.2	+ 9.0	+ 4.8	+ 3.1	+ 1.2	- 1.7	+ 0.2	- 1.7	+ 0.2	+ 2.1	+ 1.9	- 0.3	+ 1.0	+ 0.5	- 1.2	+ 1.0	+ 2.0	+ 0.8
19th	+ 1.6	+ 2.3	+ 2.2	+ 4.3	+ 6.8	+ 5.6	-	-	+ 5.5	+ 5.9	+ 6.2	+ 4.6	+ 2.6	- 0.1	- 0.6	- 1.1	+ 1.6	+ 3.7	+ 4.9	+ 4.9	+ 4.5	+ 3.3	+ 3.4	+ 3.3
20th	+ 4.3	+ 4.6	+ 5.0	+ 5.9	+ 6.0	+ 6.7	+ 7.3	+ 7.0	+ 7.6	+ 8.2	+ 7.4	+ 6.0	+ 4.5	+ 3.2	+ 1.9	+ 3.0	+ 4.8	+ 6.5	+ 5.4	+ 5.8	+ 6.2	+ 5.7	+ 5.7	+ 6.1
21st	+ 6.8	+ 6.9	+ 7.7	+ 7.2	+ 8.7	+ 9.8	+ 10.0	+ 9.5	+ 9.6	+ 7.7	+ 7.6	+ 5.8	+ 4.7	+ 5.5	+ 4.1	+ 4.7	+ 5.4	+ 6.7	+ 6.6	+ 6.8	+ 6.0	+ 6.6	+ 5.5	+ 5.8
22d	+ 5.4	+ 6.3	+ 6.4	+ 6.9	+ 6.9	+ 7.0	+ 6.9	+ 7.5	+ 8.5	+ 9.4	+ 9.6	+ 8.3	+ 11.7	+ 10.5	+ 7.3	+ 8.6	+ 7.6	+ 10.1	+ 9.7	+ 9.0	+ 6.4	+ 0.5	+ 4.3	+ 4.9
23d	+ 5.0	+ 9.1	+ 7.9	+ 7.2	+ 9.1	+ 6.5	+ 6.9	-	+ 13.3	+ 13.9	+ 13.4	+ 13.2	+ 13.3	+ 9.0	+ 6.7	+ 8.7	+ 9.3	+ 10.2	+ 9.2	+ 9.5	+ 6.7	+ 6.6	+ 7.9	+ 8.7
24th	+ 6.9	+ 5.3	+ 6.7	+ 10.9	+ 12.6	+ 7.2	+ 3.3	+ 8.8	+ 5.8	+ 5.0	+ 2.1	- 2.8	- 8.8	- 11.1	- 13.8	- 12.7	- 21.8	- 28.8	- 8.1	-	+ 1.4	- 8.1	- 6.8	- 7.5
25th	- 1.1	- 5.5	- 0.7	- 3.4	- 3.0	- 2.6	- 0.4	+ 0.5	+ 0.6	+ 1.8	+ 0.8	+ 0.3	- 0.5	- 0.6	- 0.3	+ 0.2	+ 1.7	+ 1.1	+ 1.4	+ 1.3	+ 0.6	+ 0.3	- 0.6	- 2.8
26th	- 2.8	- 0.6	- 1.3	- 0.4	- 0.4	+ 1.0	+ 1.9	+ 3.6	+ 4.9	+ 4.2	+ 2.7	+ 3.3	+ 1.5	- 1.0	+ 0.3	+ 1.6	+ 2.3	+ 0.8	+ 2.8	+ 1.7	+ 3.2	+ 2.1	+ 2.4	- 0.4
27th	+ 2.8	+ 2.6	+ 3.0	+ 3.2	+ 3.8	+ 4.7	+ 4.9	+ 5.9	+ 5.7	+ 5.4	+ 4.8	+ 4.0	+ 3.7	+ 3.0	+ 0.3	+ 1.2	+ 3.2	+ 4.8	+ 4.7	+ 4.4	+ 1.9	- 1.2	- 0.6	+ 1.8
28th	+ 1.8	+ 2.3	+ 2.2	+ 1.7	+ 2.1	+ 2.3	+ 3.3	+ 3.6	+ 2.1	+ 1.3	+ 4.2	+ 2.8	+ 0.4	- 0.5	- 2.4	- 0.9	+ 1.5	-	+ 0.1	- 2.0	+ 1.0	+ 2.1	+ 1.7	+ 1.0
29th	+ 2.1	+ 0.9	+ 0.2	+ 0.1	+ 1.9	+ 1.6	+ 1.6	+ 3.4	+ 4.9	+ 5.5	+ 5.5	+ 4.2	+ 4.0	+ 3.0	+ 2.9	+ 2.9	+ 2.5	+ 3.0	+ 2.3	+ 0.6	- 0.3	+ 0.0	- 1.4	- 2.3
30th	- 1.8	- 1.4	- 0.2	+ 0.6	+ 1.3	+ 1.8	+ 2.5	+ 3.1	+ 4.6	+ 5.1	+ 5.2	+ 5.0	+ 3.5	+ 3.2	+ 0.7	+ 1.8	+ 3.1	+ 3.5	+ 2.3	+ 4.4	+ 3.1	+ 2.9	+ 3.3	+ 3.1
31st	+ 6.7	+ 6.4	+ 3.5	+ 4.3	+ 4.1	+ 3.6	+ 3.5	+ 4.6	+ 5.8	+ 6.1	+ 6.5	+ 4.8	+ 4.3	+ 5.1	+ 3.4	+ 0.3	+ 1.1	+ 0.6	+ 0.7	+ 2.6	+ 3.6	+ 3.6	+ 2.7	+ 1.2
Means	+ 2.40	+ 2.74	+ 2.92	+ 3.19	+ 3.60	+ 3.50	+ 3.74	+ 4.30	+ 4.45	+ 3.77	+ 2.44	+ 1.15	+ 0.39	- 0.55	- 1.28	- 0.55	+ 0.25	+ 0.16	+ 1.61	+ 2.09	+ 2.59	+ 1.75	+ 1.94	+ 2.46
Normals	+ 3.01	+ 3.36	+ 2.92	+ 3.19	+ 3.29	+ 3.50	+ 3.74	+ 4.30	+ 4.60	+ 4.10	+ 3.68	+ 1.76	+ 0.91	+ 0.45	- 0.35	+ 0.62	+ 1.58	+ 1.98	+ 2.46	+ 2.77	+ 2.39	+ 2.42	+ 2.56	+ 3.07

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JUNE 1858.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.2	+ 1.6	+ 2.7	+ 2.8	+ 3.2	+ 3.6	+ 4.3	+ 5.5	+ 7.4	+ 7.9	+ 7.1	+ 6.7	+ 5.1	+ 3.7	+ 1.8	+ 1.9	+ 3.8	+ 4.0	+ 4.8	+ 4.3	+ 3.5	+ 2.0	+ 2.9	+ 3.4
2d	+ 3.8	+ 3.9	+ 4.7	+ 4.1	+ 3.8	+ 4.6	+ 4.3	+ 5.0	+ 7.3	+ 8.3	+ 7.8	+ 7.3	+ 6.6	+ 6.9	+ 6.4	+ 6.1	+ 5.4	+ 6.9	+ 6.4	+ 5.9	+ 4.0	+ 3.5	+ 2.0	+ 3.1
3d	+ 4.6	+ 3.6	+ 3.5	+ 5.5	+ 5.7	+ 5.9	+ 6.2	+ 6.5	+ 6.9	+ 6.1	+ 6.9	+ 4.9	+ 4.0	+ 3.5	+ 2.4	+ 1.8	+ 3.0	+ 3.2	+ 3.2	+ 1.1	+ 3.7	+ 1.8	+ 2.2	+ 2.0
4th	+ 3.2	+ 8.0	+ 5.2	+ 5.2	+ 5.3	+ 7.0	+ 6.7	+ 5.7	+ 6.0	+ 7.6	+ 4.1	- 6.5	- 6.5	- 0.6	- 6.2	- 4.7	- 5.9	+ 3.8	- 1.7	- 6.2	- 3.7	- 12.6	- 3.2	- 3.7
5th	+ 2.4	+ 0.2	- 0.7	+ 2.2	+ 8.2	+ 2.4	+ 2.8	- 0.3	- 4.6	+ 2.4	+ 0.8	- 0.1	- 0.6	- 0.9	- 0.6	- 3.0	- 1.4	-	+ 3.2	+ 0.5	- 2.5	+ 3.0	- 1.1	+ 0.3
6th	+ 0.2	+ 0.7	+ 1.9	- 0.3	+ 5.9	+ 4.5	+ 2.2	+ 3.3	+ 1.9	+ 3.8	+ 4.0	+ 2.9	+ 1.2	- 5.0	- 0.5	+ 0.1	- 2.3	- 0.4	+ 1.2	- 0.5	-	- 0.6	+ 0.8	+ 1.2
7th	+ 1.0	+ 1.7	+ 4.2	+ 4.8	+ 2.8	+ 3.3	+ 1.2	+ 1.1	+ 4.0	+ 4.2	+ 1.6	- 5.5	- 3.4	- 7.0	- 1.5	- 4.9	- 1.1	- 1.3	+ 3.6	+ 1.2	+ 0.8	+ 1.2	+ 1.8	+ 2.1
8th	- 1.3	+ 1.7	- 0.2	+ 0.8	+ 1.4	+ 1.2	+ 1.9	+ 4.5	+ 3.6	- 8.9	- 0.1	+ 1.1	+ 0.4	- 2.6	-	- 1.7	- 1.9	+ 0.9	-	+ 0.6	- 3.4	- 2.7	+ 5.6	+ 2.0
9th	+ 3.8	+ 1.7	+ 1.2	+ 2.2	+ 2.2	+ 3.7	+ 3.9	+ 3.5	+ 2.1	+ 4.3	+ 2.8	+ 0.2	+ 0.2	-	- 2.1	+ 2.6	+ 3.9	+ 3.0	+ 1.5	+ 1.5	+ 2.2	+ 2.2	+ 3.2	+ 2.4
10th	+ 2.3	+ 3.0	+ 3.2	+ 4.7	+ 4.5	+ 4.1	+ 4.1	+ 3.9	+ 5.8	+ 5.1	+ 3.0	+ 2.2	+ 2.1	+ 1.4	-	+ 1.4	+ 0.1	+ 1.0	+ 2.1	+ 3.2	+ 2.8	+ 1.9	+ 2.3	+ 1.5
11th	+ 3.2	+ 3.1	+ 3.2	+ 3.7	+ 3.9	+ 4.7	+ 5.3	+ 6.2	+ 7.1	+ 2.3	+ 5.7	+ 4.6	+ 4.3	+ 1.3	+ 0.2	+ 1.9	+ 2.0	+ 4.3	+ 4.1	+ 3.3	+ 2.3	+ 1.8	+ 1.7	+ 3.7
12th	+ 2.3	+ 2.4	+ 2.7	+ 3.4	+ 3.6	+ 4.4	+ 5.0	+ 5.3	+ 6.7	+ 6.7	+ 6.6	+ 4.3	+ 3.9	+ 1.5	- 0.1	+ 2.4	+ 3.9	+ 4.4	+ 3.5	+ 1.6	+ 0.4	- 1.0	- 1.5	+ 0.5
13th	+ 1.5	+ 2.1	+ 8.7	+ 3.8	-	+ 3.8	+ 1.9	+ 2.9	+ 3.5	+ 3.6	+ 3.4	- 0.2	- 1.5	+ 2.8	- 0.1	- 0.4	- 0.5	-	+ 1.6	0.0	- 2.3	- 2.0	0.0	+ 1.4
14th	+ 0.7	+ 1.4	+ 3.4	+ 3.5	+ 2.8	+ 3.7	+ 5.2	+ 5.8	+ 7.1	+ 6.9	+ 5.0	+ 5.4	+ 2.6	+ 2.2	+ 1.3	+ 3.2	+ 4.2	+ 1.6	+ 2.7	+ 3.1	+ 1.5	+ 0.5	+ 2.7	+ 2.2
15th	+ 2.8	+ 3.3	+ 3.5	+ 3.8	+ 3.8	+ 4.3	+ 4.6	+ 3.9	+ 4.6	+ 6.8	+ 7.6	+ 6.0	+ 4.9	+ 1.3	+ 0.0	+ 1.6	+ 3.5	+ 4.3	+ 3.8	+ 3.3	+ 3.2	+ 2.9	+ 2.9	+ 3.7
16th	+ 3.1	+ 2.9	+ 3.7	+ 4.2	+ 3.7	+ 4.2	+ 4.0	+ 4.5	+ 6.2	+ 6.7	+ 6.8	+ 6.6	- 3.2	+ 3.8	+ 3.9	+ 4.5	+ 5.9	-	+ 5.9	+ 5.1	+ 3.6	+ 3.2	+ 3.5	+ 4.4
17th	+ 5.1	+ 5.2	+ 5.2	+ 5.8	+ 6.1	+ 6.7	+ 7.5	+ 8.4	+ 12.3	+ 12.2	+ 11.5	+ 10.4	+ 12.1	+ 7.1	+ 5.0	+ 4.2	+ 6.2	+ 6.3	+ 5.5	+ 2.7	+ 3.9	+ 4.0	+ 2.3	+ 3.4
18th	+ 3.3	+ 4.7	+ 4.6	+ 5.3	+ 6.3	+ 4.3	+ 5.1	+ 1.9	+ 5.7	+ 7.1	+ 0.6	+ 4.3	+ 6.2	+ 5.5	+ 5.9	+ 5.3	+ 2.3	+ 3.4	+ 3.7	+ 4.9	+ 4.9	+ 3.7	+ 3.4	+ 1.2
19th	+ 3.1	+ 4.0	+ 5.1	+ 4.4	+ 5.4	+ 5.9	+ 6.2	+ 7.1	+ 8.7	+ 10.8	+ 10.3	+ 8.7	+ 8.8	+ 8.6	+ 5.2	- 0.3	+ 3.3	+ 4.9	+ 6.6	+ 4.6	+ 4.1	+ 3.2	+ 2.6	+ 2.6
20th	+ 2.5	+ 3.7	+ 2.6	+ 2.6	+ 2.5	+ 3.1	+ 4.5	+ 5.1	+ 6.6	+ 6.0	+ 0.9	+ 1.4	- 1.1	-	+ 3.5	+ 2.3	+ 1.9	+ 0.6	+ 3.2	- 0.1	- 10.8	- 6.8	- 3.4	+ 1.6
21st	+ 3.1	- 1.6	- 1.3	+ 1.0	+ 2.4	+ 4.5	+ 2.7	+ 3.7	+ 4.7	+ 4.1	+ 5.1	+ 3.5	+ 3.6	+ 1.0	+ 0.8	+ 1.8	+ 3.2	+ 3.9	+ 3.8	+ 3.3	+ 1.3	- 1.7	- 1.2	- 2.2
22d	+ 1.0	+ 1.3	+ 1.5	+ 1.6	+ 1.0	+ 1.0	+ 2.3	+ 1.7	+ 5.0	+ 6.4	+ 7.0	+ 7.0	+ 6.1	+ 6.0	+ 4.1	+ 4.4	+ 6.7	+ 7.2	+ 6.3	+ 5.4	+ 5.6	+ 4.7	+ 4.1	+ 4.3
23d	+ 4.0	+ 6.0	+ 6.4	+ 4.4	+ 4.9	+ 6.6	+ 6.4	+ 5.0	+ 9.4	+ 6.9	+ 8.4	+ 4.1	+ 6.0	+ 5.2	+ 4.4	+ 6.4	- 13.0	- 9.6	+ 0.7	+ 1.7	- 9.5	- 3.6	- 7.2	- 0.1
24th	+ 1.5	- 2.9	- 1.4	+ 5.2	- 1.8	- 5.9	- 6.0	- 7.7	- 7.8	- 3.5	- 4.9	- 7.6	- 6.4	- 6.3	- 11.4	- 1.2	- 9.7	- 9.3	- 12.9	- 21.0	- 13.7	- 10.2	- 9.3	+ 0.4
25th	- 7.7	- 7.8	- 9.7	- 5.7	+ 2.5	+ 2.6	+ 2.8	+ 2.4	- 2.9	- 8.7	- 13.5	- 12.4	- 11.6	- 13.8	- 11.6	- 11.1	- 9.6	- 1.2	- 12.6	- 10.0	- 8.5	- 11.1	- 4.6	+ 8.1
26th	- 3.6	- 2.1	- 2.5	- 2.3	- 1.7	- 0.8	- 0.7	- 0.4	+ 0.4	+ 1.5	+ 2.4	+ 0.3	+ 1.9	+ 0.4	- 5.1	- 6.8	- 9.6	- 6.0	- 4.5	- 3.9	- 3.5	- 3.5	- 2.7	- 3.6
27th	- 1.1	- 1.5	- 0.1	+ 0.1	+ 2.1	+ 0.6	- 8.3	- 7.4	+ 5.2	+ 4.8	+ 4.1	-	-	- 3.0	- 3.6	- 2.2	- 0.9	+ 0.2	- 1.6	- 2.7	- 4.6	- 3.7	- 4.4	- 2.9
28th	- 0.3	- 1.4	- 1.0	- 0.2	+ 0.5	+ 1.1	+ 1.8	+ 1.9	+ 4.1	+ 3.9	+ 0.9	- 1.4	- 0.4	- 1.1	- 1.6	+ 2.5	+ 1.1	+ 1.7	+ 1.5	- 0.6	- 5.2	- 4.1	- 1.3	- 2.9
29th	- 0.3	0.0	- 0.2	+ 0.5	+ 0.2	+ 2.0	+ 2.7	+ 3.7	+ 4.1	+ 4.2	+ 4.9	+ 2.8	+ 4.9	+ 1.1	- 0.7	- 2.9	+ 1.0	+ 2.0	+ 1.6	+ 1.1	+ 2.1	+ 2.8	+ 3.2	+ 2.8
30th	+ 2.2	+ 2.4	+ 2.0	- 2.1	+ 2.7	+ 3.0	+ 3.2	+ 3.5	+ 4.1	+ 3.3	+ 4.5	+ 0.1	+ 5.1	+ 6.1	+ 5.6	+ 5.5	+ 4.7	+ 8.7	+ 8.5	+ 3.1	- 4.5	- 4.3	-	- 3.3
Means	+ 1.59	+ 1.71	+ 2.07	+ 2.50	+ 3.24	+ 3.34	+ 3.13	+ 3.21	+ 4.51	+ 4.43	+ 3.84	+ 2.11	+ 2.91	+ 1.04	+ 0.17	+ 0.64	+ 0.47	+ 1.87	+ 1.91	+ 0.40	- 0.78	- 0.56	+ 0.10	+ 1.41
Normals	+ 1.91	+ 2.04	+ 2.48	+ 2.78	+ 3.24	+ 3.66	+ 3.86	+ 3.97	+ 5.57	+ 5.70	+ 4.78	+ 3.45	+ 2.71	+ 2.25	+ 1.00	+ 1.04	+ 2.48	+ 3.20	+ 2.96	+ 1.54	+ 0.80	+ 0.63	+ 0.44	+ 1.41

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JULY 1858.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	-1.9	-1.7	-2.1	-1.7	-0.4	+0.1	+1.8	+1.9	+2.2	+2.3	-0.8	-2.1	+0.3	+2.2	+3.7	+4.0	+3.4	+2.4	+0.1	-0.9	-4.0	-0.4	-4.8	-6.3
2d	-5.8	-2.8	-0.5	+1.4	+0.8	+0.2	+0.8	+2.2	+3.7	+3.8	+3.7	+3.7	+1.7	-0.3	+2.3	+2.7	+3.4	-0.7	-0.8	-3.8	+3.4	-1.4	0.0	-2.2
3d	+2.2	+1.2	+3.3	+2.6	+2.8	+0.8	+0.5	+2.7	+3.2	+4.7	+6.0	+4.6	+5.1	+4.4	-	+3.3	+5.2	+3.2	+3.2	-0.4	-1.0	0.0	-1.1	-0.4
4th	-0.9	+8.4	+1.2	+1.2	+0.6	+0.7	+2.2	+3.5	+2.3	+3.9	+4.0	+5.4	+0.5	-3.2	-0.9	-1.6	+0.5	+3.8	+3.0	-5.9	-2.0	-2.2	-1.1	+4.4
5th	+2.9	+2.5	+2.8	+2.1	+1.9	+2.5	+2.9	+2.5	+1.4	+2.9	+1.0	-	-	-	-	-	-2.1	-1.6	-3.4	-6.1	-6.6	+2.9	-5.4	-3.1
6th	+0.3	-6.1	+9.5	+9.4	-1.6	+9.2	-	-5.7	-11.5	-15.2	-4.4	-0.4	-2.1	-2.5	-0.5	-1.0	-1.6	-5.2	+1.7	-3.9	-4.7	-4.9	-5.6	-4.8
7th	-2.6	-2.6	-2.4	-0.7	+0.3	+0.7	-0.3	+0.1	+0.2	-1.5	+1.2	-2.2	-3.3	-5.6	-4.5	+0.3	-3.0	-2.9	-0.4	-2.6	-2.4	+1.2	-2.4	-2.0
8th	-1.5	-2.3	-1.9	1.2	+0.6	+0.7	+1.6	+2.0	+3.7	+4.6	+3.3	+1.8	+2.2	+2.0	+0.1	+0.7	+0.5	-	-	-9.5	-1.1	-	-0.6	-0.9
9th	-0.3	-0.4	-0.2	+0.9	+1.9	+2.6	+3.3	+4.5	+5.2	+5.2	-	-	-	+0.1	-2.7	-	-	+1.6	+0.5	-0.5	-1.0	-0.5	-2.5	-1.4
10th	-1.4	-0.0	+1.2	+2.5	+1.9	+1.6	+1.8	+1.8	+2.7	+2.6	+2.0	-3.1	-2.8	-4.4	-4.1	-0.5	-1.1	+0.7	+0.6	+0.6	+0.5	+0.7	+0.1	+0.6
11th	+1.2	+3.1	+2.1	+0.4	+4.2	+3.5	+3.5	+3.1	+4.5	+3.7	+1.5	+0.1	-0.6	-0.5	-1.1	+2.7	+1.8	-3.0	-0.8	-0.1	+0.3	+0.9	+1.6	-0.3
12th	+0.6	+4.8	+0.3	+2.1	+2.4	+3.5	+3.1	+3.8	+6.0	+5.9	+5.1	+3.4	+1.0	-0.5	-3.0	-1.9	-0.9	+0.4	+2.1	+3.0	+3.3	+3.0	+2.2	+2.4
13th	+2.2	+2.4	+2.0	+4.7	+4.0	+3.0	+2.3	+3.3	+5.4	+5.3	+4.1	+2.6	+0.9	-1.2	-0.7	+0.5	+2.7	+3.8	+4.2	+3.8	+3.0	+3.0	+2.9	+3.0
14th	+0.9	+1.0	+1.7	+1.8	+2.7	+2.7	+2.8	+3.0	+5.8	+6.8	+6.0	+4.0	+2.5	+0.3	-0.8	+0.6	+3.0	-	+4.1	+4.3	+4.1	+3.6	+3.9	+3.9
15th	+2.4	+2.4	+2.2	+1.0	+0.4	+1.3	+2.9	+3.5	+3.9	+1.9	-1.2	+1.5	+3.0	+0.4	-3.0	-1.4	+0.2	-3.1	-1.0	-1.3	+0.3	-2.2	-1.7	-0.6
16th	-2.1	-2.9	-0.5	-2.4	-0.8	+0.4	+0.8	+1.0	+1.7	+2.8	+3.2	+1.2	-0.1	+0.8	-1.3	-6.9	-0.6	-0.6	-1.1	-0.1	-2.6	-4.4	+2.8	-2.6
17th	-1.2	-1.6	-1.0	-0.6	-0.3	+0.1	+0.8	-0.1	+3.1	+2.9	+3.5	+4.0	+4.6	+3.6	+3.6	+3.2	+3.8	+3.3	+2.1	+1.8	-4.2	+0.7	+1.1	+1.5
18th	+0.4	+0.8	+1.2	+1.2	+1.4	+0.9	+2.6	+1.4	+2.5	+2.2	+1.4	+0.4	-1.0	-1.0	-0.2	+1.9	+3.5	+3.6	+1.7	+3.4	-2.5	+2.3	+1.8	+1.9
19th	+1.7	+1.0	+1.0	+1.1	+1.4	+2.0	+2.3	+3.0	+4.0	+4.4	+3.5	+2.9	+0.3	0.0	+0.3	+1.7	+3.6	+4.1	+3.5	+2.4	+2.4	+2.2	+3.5	+2.3
20th	+2.3	+1.4	+1.3	+1.7	+1.9	+2.4	+3.5	+5.8	+5.3	+4.6	+3.9	+2.4	-1.0	+0.6	+0.3	+3.6	+5.5	+2.8	+1.8	+1.7	-1.1	-1.6	-1.9	-2.1
21st	-1.8	-1.4	+1.3	-0.3	+0.2	+0.5	+0.6	+1.8	+2.7	+2.6	+2.7	+0.9	+0.5	-0.4	-0.2	-0.5	+2.4	+2.8	+2.4	+1.7	+1.8	+1.6	+1.3	+1.1
22d	-0.9	+1.0	+1.4	+1.4	+2.2	+3.1	+2.9	+3.0	+5.1	+6.4	+6.0	+4.4	+5.1	+4.3	-2.1	+3.0	+3.4	+4.3	+4.5	+3.3	+2.8	+2.4	+2.0	+1.2
23d	+5.9	-	-	+3.6	+3.5	+4.2	+4.6	+5.5	+6.3	+6.3	+5.3	+4.1	+3.5	+2.7	+0.8	+0.4	-0.9	+3.0	+2.5	+1.8	+0.8	-0.1	0.0	+1.2
24th	+1.4	+2.1	+2.5	+3.2	+3.1	+3.5	+4.1	+4.6	+6.1	+5.7	+4.2	+3.9	+2.7	+3.1	+2.2	+3.6	+3.7	+5.3	+4.2	+3.2	+2.1	+2.3	+1.9	+2.3
25th	+5.2	+2.8	+1.6	+1.2	+2.1	+2.7	+3.2	+4.5	+6.0	+5.0	+4.4	+3.3	+3.1	+2.9	+0.2	+1.3	-0.5	+2.1	+2.8	+3.0	+1.7	+0.4	-0.1	+0.2
26th	+1.0	+1.0	+2.1	+1.8	+1.2	+3.1	+4.9	+5.1	+6.7	+5.9	+4.9	+3.0	+2.3	-0.1	0.0	+1.7	+3.1	-2.9	-3.0	-1.9	-2.9	-5.9	-7.1	-5.1
27th	-6.9	-4.4	-2.0	-7.0	-1.9	-2.0	-0.5	+0.9	+1.4	+2.2	+6.3	+4.8	+0.5	-1.4	-2.6	-2.2	-0.5	+2.0	+1.2	-2.1	-0.9	-0.6	-1.3	-0.7
28th	-0.4	-0.1	+0.1	-0.1	+0.9	+0.9	+0.9	+0.4	+3.0	+4.1	+2.7	+1.8	-0.1	-3.2	-0.1	-4.1	-0.4	+1.4	-3.0	-2.1	-3.3	-1.6	-4.8	-1.9
29th	-1.9	-2.3	-1.3	-2.0	+0.3	+1.3	+2.3	+2.2	+3.5	+5.2	+4.6	+2.6	-0.2	-3.8	+2.8	-3.5	-1.6	+0.1	-8.2	-4.6	-1.4	-3.2	-2.7	-5.1
30th	+2.6	+1.8	-0.3	-2.2	-1.2	-0.9	-0.1	+0.1	+3.9	+5.2	+2.9	+2.1	+1.0	+5.3	-15.0	-7.6	-10.2	-17.5	-7.0	-4.3	-1.2	+4.5	+0.5	-3.4
31st	-1.4	-0.4	-1.9	-3.5	+2.5	-4.3	+5.3	+2.8	+3.4	-2.0	-3.3	-0.3	-2.4	-8.4	-9.2	-7.3	-4.1	-0.3	-1.7	-2.4	+0.7	-1.4	+2.0	-1.4
Means	+0.13	+0.29	+0.82	+0.76	+1.26	+1.65	+2.25	+2.39	+3.34	+3.24	+2.92	+2.10	+0.94	-0.13	-1.23	-0.16	+0.74	+0.44	+0.53	-0.31	-0.51	+0.04	-0.50	-0.59
Normals	+0.13	+0.01	+0.52	+0.47	+1.26	+1.65	+2.25	+2.66	+3.83	+3.85	+2.92	+2.10	+0.94	+0.16	-0.43	-0.16	+1.12	+1.09	+0.83	-0.31	-0.51	+0.04	-0.50	-0.59

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF AUGUST 1858.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	- 1.4	- 0.5	+ 1.8	+ 0.1	+ 0.3	+ 0.4	+ 1.3	+ 2.2	- 1.4	+ 2.6	+ 3.3	+ 0.3	- 2.8	- 0.8	- 0.7	- 3.4	- 2.6	- 0.6	+ 1.4	+ 1.0	- 0.8	+ 0.5	+ 1.5	- 0.4
2d	+ 0.4	+ 0.4	+ 1.7	+ 1.9	+ 1.6	- 1.0	+ 1.3	+ 1.5	+ 3.3	+ 3.2	+ 3.0	+ 2.6	- 0.7	- 2.8	- 4.5	- 3.4	- 2.7	- 0.5	+ 3.6	+ 0.1	- 2.6	- 1.7	- 1.2	- 2.8
3d	+ 4.2	- 0.4	- 0.4	- 0.1	- 0.7	+ 0.7	+ 1.3	+ 2.8	+ 4.5	+ 5.1	+ 5.5	+ 2.3	- 1.8	- 1.6	- 3.1	- 2.4	- 0.4	- 1.3	- 4.8	- 2.2	- 1.3	- 1.4	- 1.2	- 2.4
4th	- 1.7	- 1.1	- 0.4	+ 0.2	+ 1.2	+ 1.7	+ 0.9	+ 2.5	+ 3.0	+ 2.7	+ 0.6	- 2.8	- 2.8	- 5.5	- 5.0	- 0.4	+ 2.5	+ 2.0	- 3.2	+ 0.6	- 2.4	- 2.1	- 0.6	- 0.9
5th	- 1.2	+ 1.1	+ 0.5	+ 0.3	+ 0.6	+ 1.1	+ 1.5	+ 2.4	+ 2.6	+ 2.3	+ 1.1	+ 0.7	- 0.4	- 0.1	- 1.3	- 1.7	- 0.8	- 0.8	+ 0.1	- 0.2	+ 0.1	0.0	+ 0.4	+ 0.2
6th	+ 0.2	+ 0.4	+ 0.5	+ 1.0	+ 0.9	+ 2.2	+ 3.2	+ 2.5	+ 4.9	+ 4.2	+ 1.5	+ 1.1	+ 0.4	+ 0.1	- 2.5	- 1.1	+ 1.4	+ 3.3	+ 2.2	+ 0.6	+ 2.6	- 4.3	- 1.3	- 0.7
7th	+ 2.0	- 1.1	+ 3.1	+ 3.1	+ 3.5	+ 1.6	+ 2.6	+ 3.5	+ 3.3	+ 2.1	+ 0.6	- 1.7	- 2.7	- 2.6	- 3.6	- 3.9	- 1.2	- 1.0	- 0.7	- 0.3	- 0.4	- 0.5	- 0.8	- 1.1
8th	- 1.1	- 0.4	- 0.2	+ 0.3	+ 0.4	+ 0.7	+ 1.8	+ 3.0	+ 3.1	+ 3.0	+ 2.9	+ 1.3	- 1.3	- 3.0	- 3.1	- 3.4	- 0.2	+ 0.9	- 1.9	- 1.6	+ 0.1	+ 0.4	+ 0.5	+ 0.6
9th	+ 1.0	+ 1.1	+ 1.0	+ 1.3	+ 2.0	+ 2.8	+ 2.9	+ 4.1	+ 5.1	+ 4.5	+ 3.2	+ 1.7	+ 0.2	- 3.1	- 3.0	- 2.2	+ 0.4	+ 1.3	+ 1.0	+ 1.4	+ 1.6	+ 0.5	- 0.6	+ 1.0
10th	+ 1.0	+ 0.6	+ 0.6	+ 3.0	+ 1.1	+ 2.1	+ 3.0	+ 3.7	+ 5.2	+ 7.0	+ 5.8	+ 4.2	+ 0.3	- 0.7	+ 1.6	+ 1.3	+ 4.1	- 0.3	- 4.1	- 1.5	+ 0.1	- 1.4	- 2.5	- 2.5
11th	- 3.5	- 1.0	- 0.3	+ 2.8	+ 4.6	+ 0.5	+ 1.5	+ 3.7	+ 4.5	+ 2.1	+ 0.9	+ 1.2	+ 0.1	- 0.3	- 2.9	- 1.9	- 1.1	+ 1.0	+ 1.1	+ 1.3	+ 1.1	-	-	+ 1.2
12th	+ 1.3	+ 1.1	+ 0.4	+ 1.0	+ 1.0	+ 0.2	+ 5.4	+ 3.7	+ 5.5	+ 5.6	+ 3.8	+ 2.4	+ 0.4	- 2.2	- 3.3	- 0.2	+ 1.7	+ 2.5	+ 0.8	- 0.2	- 1.4	- 1.3	- 1.1	- 0.3
13th	+ 8.0	- 0.4	+ 8.0	+ 0.6	+ 0.7	+ 0.4	+ 5.5	+ 3.5	+ 5.2	+ 2.5	+ 3.4	+ 2.9	- 1.2	- 1.0	- 2.1	- 0.4	+ 0.7	+ 1.6	+ 2.2	+ 2.4	+ 2.5	+ 2.5	+ 1.2	+ 0.9
14th	+ 0.1	- 0.4	+ 0.9	+ 3.0	+ 1.1	+ 2.2	+ 3.3	+ 3.5	+ 4.1	+ 4.3	+ 4.2	+ 3.2	+ 1.6	+ 1.1	- 1.4	+ 0.4	+ 1.6	+ 2.5	+ 2.6	+ 0.7	- 0.2	+ 0.7	+ 0.9	+ 1.5
15th	+ 1.3	+ 1.7	+ 2.2	+ 2.5	+ 2.7	+ 3.3	+ 3.4	+ 4.6	+ 4.8	+ 5.7	+ 4.6	+ 3.3	+ 1.3	- 2.3	- 2.4	- 4.2	- 0.4	+ 1.3	+ 1.1	+ 0.1	- 0.9	0.0	- 1.0	+ 1.0
16th	+ 3.5	+ 2.6	+ 3.0	+ 4.0	+ 4.7	+ 4.3	+ 4.9	+ 6.4	+ 7.9	+ 7.9	+ 7.3	+ 5.1	+ 3.5	+ 1.0	+ 1.1	+ 0.3	+ 2.1	+ 3.3	+ 3.3	+ 3.9	+ 4.5	+ 1.9	+ 1.5	+ 1.4
17th	+ 1.2	+ 4.3	+ 4.1	+ 3.6	+ 3.9	+ 4.7	+ 4.7	+ 8.1	+ 6.7	+ 7.8	+ 8.4	+ 3.6	- 0.3	- 0.2	- 2.2	+ 0.4	+ 0.5	+ 3.1	+ 2.2	+ 2.4	+ 3.6	+ 2.7	- 1.4	+ 0.9
18th	+ 1.6	+ 3.6	+ 4.0	+ 4.5	+ 4.8	+ 6.4	+ 6.1	+ 7.2	+ 8.3	+ 7.8	+ 4.5	+ 3.5	+ 3.4	+ 1.8	+ 2.3	+ 3.8	+ 3.3	+ 1.4	- 2.2	- 3.7	- 2.0	+ 1.4	+ 1.5	+ 3.0
19th	+ 3.2	+ 4.3	+ 4.4	+ 5.3	+ 5.5	+ 4.9	+ 5.9	+ 7.7	+ 7.9	+ 6.7	+ 4.0	+ 2.0	+ 0.9	+ 1.5	+ 1.0	+ 1.8	+ 1.9	+ 1.3	+ 6.7	+ 7.1	+ 6.8	- 1.4	+ 3.0	+ 3.9
20th	+ 4.4	+ 4.9	+ 4.7	+ 5.4	+ 7.6	+ 7.4	+ 6.3	+ 8.3	+ 8.6	+ 7.9	+ 6.1	+ 5.4	+ 2.5	+ 1.1	+ 0.2	+ 1.1	+ 2.8	+ 4.2	+ 5.0	+ 5.3	+ 6.1	+ 5.8	+ 6.1	+ 6.2
21st	+ 6.1	+ 5.5	+ 6.6	+ 6.2	+ 8.0	+ 8.3	+ 9.6	+ 11.2	+ 10.6	+ 8.9	+ 6.8	+ 6.6	- 0.7	+ 1.3	+ 1.0	+ 3.8	+ 4.7	+ 4.3	- 0.9	- 2.6	+ 7.8	- 5.0	- 6.2	- 4.2
22d	- 1.2	-	+ 2.0	+ 0.7	+ 2.5	+ 1.7	+ 5.4	+ 5.5	+ 3.4	+ 4.7	+ 3.4	- 5.4	+ 1.1	- 3.3	- 6.8	- 1.2	0.0	+ 0.5	+ 0.9	+ 0.7	+ 1.8	+ 2.4	+ 2.6	+ 1.7
23d	+ 3.6	+ 3.2	+ 3.5	+ 3.7	+ 5.1	+ 5.1	+ 5.8	+ 6.6	+ 6.1	+ 3.7	+ 2.2	+ 1.2	- 2.1	- 5.2	- 1.4	+ 0.1	+ 2.3	+ 2.1	+ 2.7	+ 1.8	+ 2.7	- 1.1	+ 1.1	+ 0.9
24th	- 1.2	+ 0.9	+ 2.0	+ 2.8	+ 3.1	+ 3.0	+ 4.3	+ 1.5	+ 6.3	+ 6.6	+ 5.1	+ 2.3	- 0.1	- 2.5	- 2.5	- 8.0	- 1.6	+ 1.2	+ 2.8	+ 3.1	+ 3.6	+ 1.2	+ 3.6	-
25th	+ 4.6	+ 5.5	+ 7.0	+ 5.0	+ 5.8	+ 6.8	+ 6.4	+ 7.6	+ 7.5	+ 6.9	+ 14.1	+ 3.2	+ 2.7	+ 1.5	- 1.6	- 1.0	+ 0.9	+ 1.9	+ 1.9	+ 1.7	+ 3.0	+ 2.5	+ 4.5	+ 5.4
26th	+ 5.5	+ 5.0	+ 4.3	+ 8.9	+ 8.9	+ 6.6	+ 9.6	+ 10.9	+ 13.2	+ 9.2	+ 4.3	- 3.7	- 3.1	+ 0.9	- 10.3	- 0.3	+ 1.8	- 3.3	- 3.3	- 3.5	- 2.5	- 0.4	- 1.0	+ 0.4
27th	+ 1.0	+ 1.4	+ 4.0	+ 4.0	-	+ 3.2	+ 3.0	+ 5.1	+ 6.4	+ 4.6	- 1.4	- 0.4	+ 0.7	+ 0.6	+ 1.5	+ 0.8	+ 3.5	+ 1.6	+ 2.1	+ 1.2	+ 1.4	+ 0.2	+ 1.6	+ 2.4
28th	+ 10.0	+ 3.6	+ 1.5	+ 1.2	+ 0.6	+ 4.0	+ 5.7	+ 4.0	+ 2.2	+ 2.9	- 3.6	- 5.0	- 3.2	- 3.2	- 11.2	- 4.0	- 2.4	+ 0.1	+ 0.6	- 0.9	- 1.1	+ 0.7	+ 0.9	+ 1.7
29th	+ 4.2	+ 1.1	+ 0.5	+ 3.0	+ 2.5	+ 2.5	+ 2.6	+ 5.3	+ 6.4	+ 6.7	+ 3.8	+ 2.9	+ 1.2	- 0.3	+ 1.3	+ 1.1	+ 0.6	- 0.6	- 0.7	+ 1.0	+ 2.8	+ 3.4	+ 3.0	+ 3.3
30th	+ 2.9	+ 3.8	+ 4.1	+ 4.2	+ 5.4	+ 6.6	+ 7.3	+ 8.1	+ 12.7	+ 5.6	+ 2.2	- 1.5	- 5.5	- 9.0	-	- 4.6	+ 0.3	+ 1.4	+ 1.9	+ 2.2	- 2.6	0.0	+ 3.1	+ 2.5
31st	+ 3.4	+ 5.2	+ 3.5	+ 3.5	+ 2.6	+ 5.0	+ 4.7	+ 5.8	+ 7.1	+ 5.1	+ 4.4	- 1.3	- 3.3	- 6.0	- 7.7	- 6.7	- 2.1	- 0.2	+ 2.0	+ 2.2	+ 1.7	+ 2.4	- 0.9	+ 1.2
Means	+ 2.05	+ 1.87	+ 2.54	+ 2.81	+ 3.06	+ 3.21	+ 4.23	+ 5.05	+ 5.58	+ 5.16	+ 3.74	+ 1.33	- 0.38	- 1.45	- 2.42	- 1.27	+ 0.70	+ 1.10	+ 0.62	+ 0.78	+ 0.65	+ 0.29	+ 0.57	+ 0.87
Normals	+ 1.78	+ 1.87	+ 2.54	+ 2.81	+ 3.06	+ 3.21	+ 4.23	+ 5.05	+ 5.58	+ 5.16	+ 3.40	+ 1.33	- 0.38	- 1.45	- 2.12	- 1.27	+ 0.70	+ 1.10	+ 0.62	+ 0.78	+ 0.93	+ 0.29	+ 0.57	+ 0.87

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF SEPTEMBER 1858.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.1	+ 4.4	+ 6.7	+ 3.1	+ 2.5	+ 3.2	+ 5.4	+ 7.0	+ 4.6	+ 2.7	+ 3.6	+ 0.1	- 9.1	- 9.5	- 5.6	- 3.5	+ 0.4	+ 2.3	+ 0.4	+ 2.0	+ 1.4	+ 1.8	+ 5.8	+ 1.2
2d	+ 5.2	+ 13.0	+ 3.1	+ 3.0	+ 10.3	+ 3.2	+ 3.9	+ 2.7	+ 1.8	- 1.9	- 5.1	- 6.7	- 7.4	- 6.3	- 4.8	- 0.4	- 5.6	- 0.7	- 0.4	- 2.6	+ 2.8	- 0.2	- 0.4	+ 5.5
3d	+ 3.1	+ 4.4	+ 0.6	+ 1.0	+ 3.2	+ 3.6	+ 3.1	+ 4.4	+ 5.9	+ 4.0	+ 1.2	- 2.1	- 1.6	- 2.4	- 1.9	- 0.8	+ 1.3	+ 2.1	+ 2.3	+ 2.0	+ 0.3	+ 3.6	+ 2.2	+ 2.8
4th	+ 3.1	+ 3.1	+ 2.1	+ 3.4	+ 3.7	+ 3.8	+ 3.9	+ 6.3	+ 7.6	- 6.0	- 4.0	- 2.2	- 2.3	- 3.5	- 3.6	- 3.5	- 1.0	+ 0.3	+ 0.1	+ 2.3	+ 3.0	+ 3.4	+ 4.3	+ 3.6
5th	+ 4.2	+ 4.5	+ 5.6	+ 4.8	+ 5.4	+ 5.1	+ 5.6	+ 6.5	+ 7.2	+ 6.3	+ 3.4	- 0.7	- 2.0	- 5.2	- 5.6	- 3.3	- 0.1	+ 1.8	+ 2.9	+ 3.6	+ 3.8	+ 4.4	+ 4.4	+ 4.4
6th	+ 4.2	+ 4.7	+ 5.8	+ 4.7	+ 5.0	+ 4.9	+ 5.8	+ 6.8	+ 6.1	+ 3.8	- 0.2	- 2.9	- 2.4	- 3.4	- 2.0	0.0	+ 1.6	+ 2.9	+ 3.9	+ 4.7	+ 4.8	+ 4.9	+ 4.7	+ 4.7
7th	+ 4.5	+ 5.3	+ 6.0	+ 6.3	+ 6.5	+ 6.5	+ 7.7	+ 8.7	+ 7.8	+ 4.6	+ 2.4	- 0.5	- 3.0	- 2.2	- 0.8	+ 1.1	+ 1.7	+ 2.7	+ 4.1	+ 5.2	+ 5.4	+ 6.1	+ 6.8	+ 7.1
8th	+ 6.7	+ 7.2	+ 8.9	+ 9.2	+ 10.6	+ 9.5	+ 9.2	+ 9.3	+ 9.7	+ 5.5	+ 3.4	- 0.1	- 5.6	- 8.8	- 11.5	- 7.1	- 2.8	- 2.0	- 2.8	- 2.6	- 0.3	- 0.4	+ 1.1	+ 0.8
9th	+ 0.4	+ 1.5	+ 1.8	+ 2.0	+ 4.1	+ 4.5	+ 4.9	+ 6.5	+ 5.2	+ 1.7	- 2.9	- 5.4	- 8.1	- 9.8	- 2.6	- 4.9	- 6.8	- 5.8	- 1.8	+ 0.5	- 1.8	- 1.0	+ 2.5	+ 14.4
10th	+ 3.5	+ 3.4	+ 3.4	+ 3.5	+ 4.5	+ 4.7	+ 6.2	+ 7.8	+ 7.4	+ 5.0	- 0.8	- 4.1	- 6.7	- 4.6	- 1.1	+ 1.6	+ 1.5	+ 2.2	+ 1.9	+ 2.7	- 0.5	- 2.1	+ 4.0	- 0.5
11th	+ 1.3	+ 2.3	+ 1.3	+ 2.2	+ 3.3	+ 4.0	+ 4.6	+ 6.6	+ 7.3	+ 4.6	+ 0.6	- 4.0	- 4.4	- 2.0	- 2.0	+ 2.4	+ 2.2	+ 0.4	- 0.7	+ 5.7	+ 4.4	- 2.7	- 0.6	+ 0.4
12th	+ 5.6	+ 2.0	+ 2.7	+ 3.2	+ 6.0	+ 8.3	+ 7.2	+ 10.8	+ 8.7	+ 7.0	+ 4.2	+ 0.7	- 2.9	- 5.5	- 5.8	- 2.9	+ 0.3	+ 3.7	+ 5.6	+ 5.4	+ 5.2	+ 5.2	+ 3.1	+ 9.8
13th	+ 7.4	+ 5.2	+ 2.7	+ 4.9	+ 8.1	+ 9.0	+ 8.2	+ 7.5	+ 7.5	+ 2.0	+ 1.4	+ 1.0	- 1.1	- 0.7	+ 0.6	+ 3.4	+ 2.1	+ 1.6	+ 2.4	+ 4.2	+ 3.4	+ 5.8	+ 5.8	+ 5.4
14th	+ 7.3	+ 6.2	+ 6.1	+ 6.6	+ 6.2	+ 6.5	+ 7.8	+ 9.3	+ 10.4	+ 7.8	+ 4.5	- 0.4	- 0.9	- 2.7	- 1.3	+ 0.1	+ 2.2	+ 3.0	+ 3.1	+ 4.3	+ 5.7	+ 7.7	+ 7.0	+ 5.2
15th	+ 8.8	+ 11.5	+ 8.0	+ 8.0	+ 7.9	+ 8.7	+ 9.6	+ 10.6	+ 9.6	+ 6.3	+ 3.2	+ 0.8	+ 0.5	+ 1.0	+ 3.2	+ 0.9	+ 4.5	+ 6.2	+ 7.0	+ 4.4	+ 6.1	+ 6.3	+ 6.0	+ 9.2
16th	+ 7.7	+ 8.6	+ 8.9	+ 8.6	+ 7.7	+ 8.5	+ 6.6	+ 8.8	+ 8.7	+ 4.6	+ 1.7	- 0.7	0.0	+ 0.8	+ 2.9	+ 4.5	+ 4.7	+ 4.9	+ 5.4	+ 6.2	+ 7.5	+ 7.7	+ 8.3	+ 8.8
17th	+ 9.1	+ 9.2	+ 9.4	+ 8.7	+ 9.1	+ 9.5	+ 10.0	+ 9.7	+ 8.3	+ 4.5	- 1.9	- 3.2	- 4.7	- 5.3	- 1.9	+ 0.9	+ 3.9	+ 5.5	+ 5.7	+ 6.2	+ 6.7	+ 7.9	+ 8.9	+ 9.4
18th	+ 9.8	+ 9.8	+ 9.8	+ 9.9	+ 10.8	+ 9.9	+ 10.2	+ 10.4	+ 9.0	+ 6.8	+ 4.4	+ 3.6	+ 2.8	+ 2.1	+ 4.4	+ 6.3	+ 4.8	+ 4.2	+ 4.9	+ 4.8	+ 6.5	+ 6.6	+ 7.4	+ 6.2
19th	+ 6.5	+ 6.7	+ 6.7	+ 6.4	+ 6.2	+ 6.9	+ 8.3	+ 8.9	+ 9.1	+ 5.9	+ 2.8	- 0.7	- 1.6	+ 0.6	+ 2.0	+ 1.2	+ 3.9	+ 12.8	+ 13.6	- 0.7	- 3.4	+ 1.2	- 1.7	- 4.4
20th	+ 6.6	- 0.1	+ 0.8	- 0.6	+ 0.6	+ 1.5	+ 2.4	+ 3.0	+ 2.2	+ 1.6	- 0.9	- 4.3	- 4.9	- 4.3	- 4.7	- 3.0	- 3.1	+ 1.8	- 8.4	- 12.1	- 4.1	+ 2.5	- 7.7	- 2.3
21st	- 1.6	+ 2.2	+ 5.6	+ 4.6	+ 1.4	+ 1.7	+ 5.4	+ 1.5	- 0.4	- 9.7	- 14.2	- 14.7	- 13.2	- 10.0	- 8.8	- 7.3	- 5.7	- 8.6	- 4.2	- 1.3	- 8.5	- 5.6	- 2.5	- 2.5
22d	- 2.6	- 0.9	+ 5.1	+ 2.4	+ 2.4	+ 2.6	+ 2.5	+ 0.5	+ 2.0	- 3.8	- 3.9	- 6.7	- 6.8	- 5.0	- 4.6	- 5.6	- 7.4	- 6.9	- 1.6	+ 0.2	- 4.2	- 0.1	+ 1.2	+ 1.0
23d	+ 1.8	+ 3.1	+ 0.6	+ 1.0	+ 4.4	- 3.0	- 2.9	- 1.7	- 5.7	- 2.0	- 5.0	- 9.0	- 6.2	- 7.8	- 2.3	- 2.1	- 2.6	- 3.3	- 1.2	- 2.4	+ 0.8	- 2.8	+ 2.1	+ 1.7
24th	+ 1.6	+ 0.3	+ 1.8	+ 2.5	+ 3.1	+ 3.2	+ 3.8	+ 4.0	+ 2.6	+ 1.2	+ 0.2	- 1.8	- 3.3	- 1.0	- 4.0	- 3.6	- 2.1	- 0.8	- 5.7	+ 7.6	- 11.5	-	-	+ 2.2
25th	+ 2.1	- 1.6	+ 0.2	+ 2.5	+ 1.8	+ 1.0	+ 3.1	- 5.0	+ 2.1	- 5.2	- 9.6	- 6.1	- 8.0	- 8.2	- 3.3	- 0.5	- 0.2	0.0	- 8.9	- 0.6	- 1.2	+ 1.9	+ 2.9	+ 4.2
26th	+ 4.8	+ 6.0	+ 5.6	+ 5.3	+ 8.7	+ 6.7	+ 7.9	+ 6.2	+ 3.0	- 6.2	- 2.3	- 5.9	- 3.6	- 1.4	- 1.1	+ 2.5	+ 1.0	+ 2.0	+ 13.0	+ 1.4	+ 7.0	- 1.1	+ 3.5	+ 5.5
27th	+ 3.7	+ 4.6	+ 1.7	+ 4.5	+ 3.8	+ 4.2	+ 5.1	+ 2.0	- 1.4	+ 1.1	- 2.2	- 2.9	- 3.7	- 2.8	- 1.2	+ 0.5	+ 3.8	+ 3.3	+ 3.8	+ 3.1	+ 4.2	+ 4.6	+ 3.7	+ 5.0
28th	+ 4.3	+ 3.7	+ 3.3	+ 3.9	+ 3.9	+ 4.1	+ 4.7	+ 4.1	+ 2.9	+ 1.0	- 1.9	- 1.8	- 1.8	- 1.1	+ 0.8	+ 3.7	+ 4.3	+ 4.4	+ 4.8	+ 5.8	+ 6.1	+ 5.8	+ 5.5	+ 5.8
29th	+ 5.1	+ 4.8	+ 5.2	+ 5.8	+ 5.6	+ 6.1	+ 6.6	+ 6.9	+ 6.3	+ 5.5	+ 3.6	+ 1.2	+ 0.8	+ 1.7	+ 2.6	+ 4.4	+ 5.1	+ 4.7	+ 5.2	+ 5.8	+ 5.8	+ 7.0	+ 6.7	+ 6.3
30th	+ 6.8	+ 6.9	+ 6.8	+ 6.7	+ 7.0	+ 6.7	+ 7.2	+ 6.6	+ 5.7	+ 3.1	+ 0.2	- 3.1	- 3.7	+ 1.0	+ 3.7	+ 5.7	+ 7.7	+ 7.8	+ 8.2	+ 7.5	+ 6.0	+ 7.9	+ 8.3	+ 7.5
Means	+ 4.40	+ 4.73	+ 4.54	+ 4.60	+ 5.46	+ 5.17	+ 5.80	+ 5.89	+ 5.37	+ 2.06	- 0.47	- 2.75	- 3.83	- 3.54	- 2.01	- 0.31	+ 0.65	+ 1.75	+ 2.09	+ 2.44	+ 2.05	+ 3.17	+ 3.56	+ 4.28
Normals	+ 4.40	+ 4.45	+ 4.54	+ 4.60	+ 5.46	+ 5.45	+ 6.10	+ 6.55	+ 5.76	+ 3.42	+ 0.35	- 2.34	- 3.51	- 3.54	- 1.68	- 0.31	+ 0.90	+ 2.04	+ 2.05	+ 2.94	+ 2.91	+ 3.48	+ 3.96	+ 4.23

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF OCTOBER 1858.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 9.8	- 1.5	+ 8.0	+ 7.6	+ 7.8	+ 8.4	+ 11.3	+ 9.3	+ 7.6	+ 4.6	+ 1.9	- 1.2	- 0.2	+ 2.5	+ 3.9	+ 5.9	+ 5.9	+ 3.5	+ 5.8	+ 4.4	+ 7.3	+ 7.6	- 1.5	+ 2.9
2d	+ 1.0	+ 7.5	+ 2.0	+ 2.8	+ 2.2	+ 5.6	+ 5.0	+ 4.1	+ 2.8	+ 0.6	- 4.8	- 4.7	- 3.8	- 0.4	+ 3.4	+ 2.9	+ 2.5	+ 4.8	+ 4.2	+ 4.3	+ 3.6	+ 3.2	- 4.7	- 8.4
3d	+ 4.3	+ 6.3	+ 4.7	+ 2.6	+ 2.8	+ 5.6	+ 3.3	+ 0.8	- 0.5	- 3.2	- 4.9	- 4.9	- 5.3	- 8.5	- 2.2	+ 1.1	+ 0.9	+ 0.2	+ 4.7	- 8.2	+ 1.4	- 1.8	- 1.6	- 1.1
4th	+ 2.2	+ 1.7	+ 1.2	+ 7.3	+ 4.9	+ 0.1	+ 0.5	- 0.3	- 1.3	- 2.9	- 4.4	- 3.8	- 4.8	- 0.5	+ 2.3	+ 4.2	+ 5.4	+ 2.3	+ 1.8	+ 2.7	+ 2.7	+ 2.8	+ 2.4	+ 1.8
5th	+ 0.2	+ 1.6	+ 1.4	+ 3.3	+ 4.6	+ 5.1	+ 5.5	+ 4.1	+ 2.0	+ 1.2	+ 0.2	- 3.0	- 3.6	- 5.4	- 2.5	- 3.1	+ 0.4	+ 2.3	+ 2.2	+ 2.3	+ 3.5	+ 3.6	+ 3.7	+ 4.1
6th	+ 5.8	+ 4.8	+ 5.8	+ 5.2	+ 6.1	+ 6.1	+ 6.6	+ 5.9	+ 6.0	+ 4.0	+ 1.2	- 0.9	+ 2.1	+ 1.4	+ 4.3	+ 3.6	+ 2.3	0.0	+ 0.9	+ 1.2	+ 1.0	+ 1.3	+ 7.3	+ 1.7
7th	+ 1.4	+ 0.2	- 4.0	- 2.2	- 1.0	+ 0.7	+ 0.9	+ 0.7	- 0.6	- 3.5	- 6.6	- 8.2	- 13.5	- 4.6	+ 2.6	+ 4.0	+ 3.6	- 0.5	+ 1.0	- 1.1	- 2.1	- 2.4	- 0.6	- 1.4
8th	- 2.4	- 1.0	+ 0.3	+ 1.7	+ 0.9	+ 1.0	+ 2.0	- 0.4	- 2.9	- 7.9	- 9.7	- 12.3	- 9.4	- 6.7	- 2.0	+ 0.5	+ 2.9	+ 3.4	+ 0.7	+ 1.9	+ 0.9	+ 1.8	+ 2.0	+ 3.7
9th	+ 5.3	+ 5.8	+ 18.0	+ 10.3	+ 6.3	+ 5.4	+ 2.8	+ 3.4	+ 2.5	- 5.5	- 9.3	- 10.0	- 8.0	- 3.6	- 0.7	- 0.3	- 1.3	+ 0.8	+ 1.4	+ 0.2	- 0.2	- 3.8	+ 4.0	- 2.3
10th	+ 1.0	+ 0.6	+ 0.6	+ 11.1	+ 2.6	+ 3.0	+ 3.4	+ 1.6	+ 1.0	- 3.5	- 4.5	- 3.7	- 2.6	- 1.9	- 0.3	- 0.7	- 0.4	- 3.7	+ 0.5	+ 2.4	+ 3.2	+ 1.6	+ 1.1	+ 0.9
11th	+ 1.8	+ 1.8	+ 2.8	+ 2.6	+ 2.5	+ 2.6	+ 2.6	+ 2.7	+ 0.6	- 2.6	- 4.4	- 5.7	- 5.0	- 3.4	+ 2.8	+ 2.6	+ 3.1	+ 3.1	+ 3.3	+ 1.1	+ 4.4	+ 4.4	+ 4.7	+ 5.2
12th	+ 5.3	+ 4.3	+ 4.2	+ 4.5	+ 6.4	+ 6.3	+ 7.2	+ 7.9	+ 6.4	+ 3.7	+ 0.6	- 0.5	+ 1.0	+ 2.5	+ 3.9	+ 5.4	+ 7.1	+ 6.2	+ 4.8	+ 5.8	+ 6.8	+ 6.2	+ 7.0	+ 6.1
13th	+ 7.4	+ 7.7	+ 6.1	+ 8.1	+ 9.7	+ 10.8	+ 9.3	+ 9.9	+ 6.8	+ 3.6	+ 1.6	- 1.3	+ 1.9	+ 6.6	+ 7.9	+ 9.6	+ 7.3	+ 14.2	+ 4.7	+ 4.6	+ 4.6	+ 5.5	+ 4.6	+ 6.0
14th	+ 3.5	+ 3.3	+ 5.2	+ 4.7	+ 4.3	+ 6.4	+ 5.5	+ 5.0	+ 2.4	- 3.6	- 3.8	- 2.5	0.0	+ 2.6	+ 4.8	+ 5.0	+ 3.1	+ 5.2	+ 4.6	+ 5.1	+ 5.3	+ 5.2	+ 5.4	+ 5.4
15th	+ 5.0	+ 5.2	+ 5.5	+ 5.8	+ 6.1	+ 7.1	+ 7.0	+ 6.4	+ 5.2	+ 1.6	- 1.1	- 3.0	- 1.5	0.0	+ 2.8	+ 6.8	+ 8.0	+ 8.3	+ 7.5	+ 6.6	+ 8.0	+ 8.0	+ 7.8	+ 7.9
16th	+ 7.1	+ 7.1	+ 7.5	+ 7.9	+ 8.7	+ 9.4	+ 8.8	+ 8.5	+ 7.4	+ 4.0	+ 0.8	- 2.1	- 1.5	+ 2.4	+ 5.5	+ 6.9	+ 6.6	+ 6.9	+ 8.0	+ 6.6	+ 6.5	+ 8.4	+ 6.9	+ 7.9
17th	+ 7.2	+ 7.5	+ 6.6	+ 8.3	+ 8.9	+ 9.1	+ 10.2	+ 9.0	+ 8.5	+ 2.8	+ 0.5	- 0.2	+ 1.3	+ 1.6	+ 3.9	+ 8.7	+ 4.8	+ 6.2	+ 6.4	+ 5.9	+ 6.6	+ 6.6	+ 7.1	+ 6.5
18th	+ 5.5	+ 6.9	+ 6.1	+ 6.4	+ 11.0	+ 8.9	+ 13.7	+ 9.3	+ 6.8	- 0.7	+ 0.7	+ 1.7	+ 2.0	+ 0.9	+ 1.9	+ 2.0	+ 4.1	+ 2.9	+ 4.8	+ 6.3	+ 5.6	+ 6.5	+ 7.1	+ 5.6
19th	+ 6.6	+ 1.5	+ 2.4	+ 3.0	+ 4.8	+ 8.1	+ 6.8	+ 5.9	- 3.0	- 7.9	- 8.2	- 7.3	- 7.4	- 4.6	- 5.4	- 3.5	- 3.8	- 2.7	- 6.7	- 7.2	- 0.6	+ 1.4	+ 0.4	+ 0.2
20th	+ 1.5	+ 1.1	+ 2.1	+ 5.2	+ 5.3	+ 6.7	+ 7.1	+ 1.3	- 9.0	- 7.4	- 5.7	- 5.7	- 4.2	- 2.7	- 1.0	+ 1.7	+ 3.5	+ 3.1	+ 2.5	+ 2.5	+ 3.0	+ 3.3	+ 2.8	+ 3.7
21st	+ 4.8	+ 3.8	+ 4.5	+ 6.8	+ 6.6	+ 6.6	+ 4.1	+ 4.2	+ 2.0	- 0.1	- 3.3	- 6.5	- 4.3	+ 2.4	+ 4.5	+ 3.7	+ 3.5	+ 4.5	+ 3.6	+ 3.7	+ 3.5	+ 4.8	- 6.3	+ 2.5
22d	+ 3.7	+ 3.1	+ 4.4	+ 3.7	+ 2.7	+ 4.2	+ 4.4	+ 3.5	+ 1.0	- 1.9	- 4.0	- 6.2	- 5.0	- 0.1	+ 2.6	0.0	- 1.7	+ 1.2	+ 4.0	+ 3.2	+ 4.9	+ 5.6	+ 4.2	- 0.9
23d	+ 3.7	+ 3.9	+ 3.5	+ 3.9	+ 6.0	+ 6.7	+ 7.8	+ 4.8	+ 11.0	+ 0.2	- 4.1	- 5.3	- 2.9	+ 1.4	+ 5.5	+ 5.7	+ 4.6	+ 3.8	- 4.6	+ 4.2	+ 6.6	+ 4.7	+ 5.9	+ 6.2
24th	+ 5.7	+ 7.1	+ 6.9	+ 6.5	+ 5.5	+ 8.3	+ 7.9	+ 6.1	+ 5.8	+ 2.8	- 4.7	- 8.8	- 4.5	- 0.9	+ 3.3	+ 6.0	+ 1.4	+ 3.9	+ 3.0	+ 4.4	+ 4.8	+ 4.2	+ 4.4	+ 4.9
25th	+ 5.1	+ 5.0	+ 4.9	+ 6.1	+ 6.4	+ 7.1	+ 7.3	+ 6.1	+ 2.5	- 2.3	- 7.7	- 8.8	- 6.1	- 1.5	+ 3.2	+ 3.7	+ 4.7	+ 4.4	+ 4.6	+ 5.3	+ 6.6	+ 6.3	+ 5.7	+ 5.8
26th	+ 5.1	+ 6.8	+ 7.1	+ 6.4	+ 5.9	+ 6.1	+ 7.5	+ 7.5	+ 5.2	+ 4.9	+ 3.8	+ 2.6	+ 1.4	+ 2.3	+ 4.2	+ 6.6	+ 4.8	+ 5.6	- 4.1	- 3.3	+ 6.9	+ 7.6	+ 7.1	+ 7.6
27th	+ 5.3	+ 5.9	+ 6.2	+ 9.4	+ 9.2	+ 7.6	+ 8.6	+ 6.5	+ 3.9	+ 1.8	- 1.1	- 2.0	- 1.9	+ 4.1	+ 4.1	+ 7.2	+ 6.1	+ 4.0	+ 0.5	+ 2.5	- 1.1	- 0.5	- 0.1	+ 0.1
28th	- 0.1	+ 0.8	+ 1.7	+ 2.9	+ 4.3	+ 3.8	+ 4.4	+ 4.7	+ 3.4	- 8.8	- 30.0	- 15.4	- 3.4	- 18.6	- 5.9	- 1.3	- 11.9	- 9.6	- 13.5	- 12.0	- 10.4	- 8.2	- 7.8	- 5.6
29th	- 5.2	- 5.7	- 7.1	- 6.1	- 6.1	- 5.3	- 5.0	- 5.7	- 7.5	- 8.9	- 12.8	- 14.2	- 9.3	- 5.8	- 3.7	- 0.6	- 0.7	- 1.2	- 0.5	- 3.1	- 1.3	- 2.4	- 3.6	- 2.8
30th	- 3.5	+ 0.7	- 1.7	- 2.0	- 0.3	- 3.7	- 1.2	- 0.9	- 4.1	- 5.3	- 5.6	- 8.0	- 3.0	+ 0.9	+ 5.4	+ 1.9	+ 1.9	- 2.2	- 3.5	- 1.3	+ 3.9	- 13.0	- 5.3	- 5.2
31st	- 1.5	- 0.8	- 1.5	- 1.2	- 2.5	- 1.9	- 0.7	- 1.1	- 3.2	- 5.1	- 5.7	- 5.7	- 1.6	- 0.6	+ 1.5	- 0.8	- 2.0	+ 1.8	+ 0.3	+ 1.1	+ 1.9	+ 0.2	0.0	+ 1.5
Means	+ 3.25	+ 3.32	+ 3.72	+ 4.60	+ 4.60	+ 5.03	+ 5.31	+ 4.22	+ 2.22	- 1.46	- 4.36	- 5.08	- 3.33	- 1.23	+ 1.95	+ 3.08	+ 2.48	+ 2.67	+ 1.71	+ 1.68	+ 3.15	+ 2.54	+ 2.26	+ 2.27
Normals	+ 3.53	+ 3.62	+ 3.60	+ 4.96	+ 4.96	+ 5.69	+ 5.38	+ 4.55	+ 2.65	- 1.46	- 3.43	- 4.41	- 2.99	- 0.65	+ 1.95	+ 3.08	+ 2.95	+ 2.69	+ 2.52	+ 2.84	+ 3.61	+ 3.44	+ 3.20	+ 3.20

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF NOVEMBER 1958.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 0.2	+ 1.2	- 0.1	+ 0.3	+ 1.1	+ 2.9	+ 2.3	+ 1.3	- 6.4	-11.0	-14.0	-15.1	-12.7	- 9.5	- 4.1	- 2.9	- 3.8	- 0.1	- 0.7	- 0.7	- 3.0	+ 0.9	- 4.5	- 0.8
2d	- 3.0	- 2.8	- 2.4	- 1.4	- 1.7	- 2.1	- 3.2	- 5.1	- 9.2	- 9.3	-10.3	-10.7	- 6.7	- 5.2	- 2.6	+ 1.0	- 1.2	- 0.3	+ 1.0	+ 1.2	- 1.1	- 1.6	+ 0.4	- 2.3
3d	- 1.7	+ 2.7	+ 0.5	+ 0.3	- 0.2	+ 0.4	- 0.1	- 0.7	- 2.7	- 6.9	- 9.9	- 9.2	- 6.4	- 2.5	+ 0.6	+ 1.5	+ 2.4	+ 2.4	+ 3.3	+ 2.8	+ 1.7	- 1.3	- 2.4	+ 1.6
4th	- 1.1	- 1.1	- 0.9	+ 0.1	+ 0.6	+ 2.9	+ 0.8	- 1.5	- 4.6	-11.3	-10.6	- 8.8	- 5.8	- 4.4	- 1.5	+ 1.6	+ 2.0	+ 1.8	+ 0.7	+ 0.2	0.0	- 0.7	+ 0.5	+ 0.4
5th	- 0.9	- 0.5	0.0	- 0.5	+ 1.2	+ 1.5	+ 2.4	+ 2.6	- 0.2	- 2.2	- 5.3	- 7.3	- 6.4	- 3.5	+ 0.2	+ 1.8	+ 1.7	- 0.5	+ 1.6	+ 0.5	- 0.5	+ 0.2	+ 0.5	+ 2.2
6th	+ 0.9	- 0.7	+ 1.3	+ 2.1	+ 2.4	+ 3.4	+ 2.3	+ 0.8	- 1.1	- 3.7	- 7.2	- 4.1	-10.8	+ 3.4	+ 4.1	+ 3.5	+ 2.6	+ 2.0	+ 2.3	+ 2.2	+ 2.5	+ 2.1	+ 2.0	+ 1.2
7th	+ 1.0	+ 0.7	+ 0.9	+ 0.9	+ 1.9	+ 1.0	+ 1.1	- 0.5	- 4.5	- 6.5	- 7.0	- 5.4	- 3.5	- 1.1	+ 1.0	+ 5.0	+ 4.9	+ 2.0	+ 2.8	+ 2.7	+ 2.5	+ 1.4	+ 1.9	+ 2.0
8th	+ 1.9	+ 2.8	+ 2.8	+ 3.3	+ 2.6	+ 3.8	+ 3.8	+ 2.2	- 2.3	- 5.1	- 4.7	- 3.3	- 0.8	+ 1.8	+ 4.3	+ 5.6	+ 3.9	+ 1.7	+ 1.7	+ 2.1	+ 2.4	+ 1.9	+ 2.0	+ 2.6
9th	+ 0.8	+ 3.4	+ 3.5	+ 2.6	+ 3.5	+ 4.4	+ 4.2	+ 2.5	+ 0.8	- 1.8	- 3.1	- 1.9	+ 1.2	+ 4.5	+ 6.5	+ 7.1	+ 5.3	+ 3.8	+ 4.4	+ 4.3	+ 3.3	+ 2.8	+ 3.7	+ 3.8
10th	+ 3.3	+ 3.9	+ 4.1	+ 3.4	+ 4.3	+ 5.0	+ 5.9	+ 5.1	+ 2.8	+ 0.3	- 0.8	- 1.7	+ 0.3	+ 3.0	+ 4.7	+ 4.2	+ 3.8	+ 2.5	+ 2.8	+ 3.5	+ 3.2	+ 3.9	+ 3.5	
11th	+ 3.3	+ 2.7	+ 3.1	+ 3.6	+ 4.4	+ 4.2	+ 2.5	+ 4.4	+ 2.0	- 1.7	- 3.0	- 3.0	- 1.8	+ 0.2	+ 0.6	+ 1.3	+ 3.8	+ 3.3	+ 3.2	+ 3.1	+ 3.4	+ 3.1	+ 2.7	+ 2.0
12th	+ 2.5	+ 2.9	+ 2.4	+ 4.7	+ 5.0	+ 4.2	+ 5.8	+ 5.5	+ 3.2	+ 0.3	- 2.8	- 2.8	+ 1.7	+ 3.5	+ 7.0	+10.5	+12.0	+12.4	+ 5.2	+ 7.1	+10.0	+ 6.6	+ 0.1	+ 3.4
13th	+ 5.8	+ 5.1	+ 2.6	+ 3.3	+ 3.6	+ 3.4	+ 4.2	+ 3.7	+ 1.4	- 0.6	- 2.3	- 2.6	- 1.1	- 0.9	+ 1.1	+ 3.6	+ 7.7	+ 7.5	+ 3.4	+ 3.9	- 4.8	+ 5.8	+ 4.5	+ 5.5
14th	- 7.2	+ 6.2	+ 3.2	+ 2.7	+ 3.4	+ 3.8	+ 1.4	+ 4.1	+ 0.8	- 0.9	- 1.4	- 1.8	+ 1.5	+ 4.4	+ 5.1	+ 8.6	+ 6.1	+ 2.6	+ 2.3	+ 3.8	+ 1.9	0.0	+ 2.6	+ 3.1
15th	+ 1.3	+ 0.5	+ 2.6	+ 1.4	+ 2.0	+ 2.8	+ 3.2	+ 1.9	- 0.5	- 3.3	- 4.1	- 2.6	0.0	+ 3.3	+ 4.3	+ 3.9	+ 1.8	+ 1.1	+ 1.3	- 1.3	- 3.1	- 2.9	+ 3.1	+ 4.3
16th	+ 3.7	+ 0.1	+11.3	+ 3.9	- 0.2	+ 0.4	- 0.4	- 2.7	- 5.9	- 0.7	- 5.5	- 4.9	- 4.0	- 2.8	+ 2.0	+ 3.0	- 2.2	+ 0.4	+ 2.0	+ 2.8	+ 4.4	+ 4.9	+ 5.3	+ 1.6
17th	+ 2.6	+ 3.3	+ 3.3	+ 3.3	+ 4.3	+ 5.8	+ 5.6	+ 2.1	- 3.1	- 8.5	- 4.4	- 6.5	- 1.6	+ 3.2	+ 5.1	+ 5.3	+ 4.4	+ 4.3	+ 7.0	+ 6.1	+ 5.6	+ 5.1	+ 5.8	+ 6.2
18th	+ 7.4	+ 7.4	+ 8.5	+ 7.3	+ 7.9	+ 7.9	+ 7.9	+ 6.2	+ 2.6	- 1.3	- 3.6	- 2.5	+ 4.6	+ 7.4	+ 6.3	+10.2	+ 5.6	+ 3.8	+ 0.8	- 0.3	- 0.5	+ 0.5	+ 3.5	+ 4.4
19th	+ 1.0	+ 2.3	+ 5.6	+ 4.3	+ 3.3	+ 3.5	+ 4.2	+ 1.9	- 0.7	- 3.7	- 6.6	- 6.9	- 4.4	- 5.5	- 6.5	- 2.3	+ 4.0	- 2.2	+ 5.6	- 2.6	- 6.5	- 7.4	- 6.3	- 6.4
20th	+ 1.8	- 7.5	- 0.3	+ 4.5	+ 2.9	+ 1.2	- 1.1	- 6.0	-10.5	-11.8	-11.9	-11.2	- 6.8	+ 0.2	+ 2.4	+ 6.1	+ 7.2	+ 5.7	+ 3.9	+ 4.8	+ 4.5	+ 3.7	+ 2.5	0.0
21st	+ 1.9	+ 0.3	+ 0.1	+ 2.4	+ 1.0	+ 2.1	+ 4.3	+ 2.4	- 1.3	- 4.7	- 7.9	- 8.8	- 5.7	- 0.1	+ 5.9	+ 7.4	+ 6.1	+ 4.5	+ 2.3	+ 1.6	+ 3.4	+ 2.5	+ 1.7	+ 2.5
22d	+ 2.1	+ 2.0	+ 2.3	+ 2.6	+ 3.8	+ 5.5	+ 4.4	+ 2.7	- 2.1	- 6.2	- 8.4	- 7.0	- 1.4	+ 5.7	+ 9.5	+11.1	+ 6.5	+ 4.0	+ 3.6	- 1.1	+ 3.7	+ 7.2	+ 6.8	+ 5.5
23d	+ 5.4	+ 5.6	+ 6.4	+ 6.7	+ 6.6	+ 7.4	+ 8.3	+ 7.2	+ 3.6	+ 0.1	- 2.2	- 0.1	+ 4.3	+ 7.9	+ 9.1	+ 9.9	+10.9	+ 8.9	+ 7.8	+ 7.9	+ 7.9	+ 9.4	+ 8.0	+ 7.1
24th	+ 8.7	+10.8	+ 7.8	+ 8.6	+ 8.5	+ 9.6	+10.1	+ 9.6	+ 7.9	+ 2.2	- 1.2	+ 1.1	+ 8.6	+12.0	+14.4	+15.7	+13.7	+12.0	+ 4.2	+ 0.9	+ 0.5	+ 2.1	+10.1	+ 9.0
25th	+12.6	+10.4	+ 9.9	+10.2	+10.4	+11.1	+10.8	+ 9.2	+ 4.9	+ 1.4	- 1.4	- 1.0	+ 2.8	+ 8.1	+12.8	+11.1	+ 8.7	+ 6.5	+ 8.5	+ 8.4	+ 7.8	+ 8.7	+ 9.2	+ 9.0
26th	+ 7.3	+ 7.4	+ 6.5	+ 6.9	+ 5.8	+ 6.5	+ 6.9	+ 7.0	+ 2.3	- 0.9	- 1.5	+ 0.2	+ 2.9	+ 7.4	+10.2	+11.4	+11.8	+10.8	+ 9.2	+11.1	+10.5	+10.3	+ 9.3	+ 8.0
27th	+ 5.4	+10.6	+11.3	+ 6.6	+ 7.2	+ 7.5	+ 5.9	+ 9.3	+ 7.4	+ 3.2	- 0.5	+ 0.6	+ 5.5	+ 7.8	+12.3	+10.7	+ 7.4	+10.3	+ 7.9	+ 8.0	+ 4.8	-	+ 5.7	+ 4.2
28th	+ 4.5	+ 6.6	+ 7.0	+ 6.5	+ 6.0	+ 5.6	+ 7.0	+ 5.5	+ 2.6	+ 1.1	- 0.4	- 9.7	+ 2.4	+ 4.9	+ 6.6	+ 8.4	+ 8.2	+ 7.3	+ 7.8	+ 7.7	+ 7.2	+ 7.8	+ 5.2	+ 6.5
29th	+ 7.9	+ 7.2	+ 9.0	+ 8.0	+ 7.8	+ 7.6	+ 7.3	+ 5.8	+ 4.8	+ 2.5	+ 3.7	+ 6.5	+ 9.7	+12.9	+13.9	+13.8	+11.3	+ 8.2	+ 8.8	+ 8.5	+ 5.5	+ 7.0	+ 7.5	+ 7.3
30th	+ 7.7	+ 7.3	+ 7.6	+ 7.3	+ 9.3	+ 9.2	+ 8.8	+ 6.9	+ 5.5	+ 3.7	+ 3.1	+ 4.9	+ 8.1	+11.1	+12.0	+11.8	+ 9.5	+ 9.2	+ 9.2	- 1.1	+10.4	+10.8	+10.5	+ 9.3
Means	+2.90	+3.36	+4.00	+3.86	+3.96	+4.42	+4.22	+3.11	-0.08	-2.91	-4.51	-4.19	-0.88	+2.57	+4.91	+6.32	+5.55	+4.57	+4.12	+3.25	+2.93	+3.24	+3.53	+3.56
Normals	+2.92	+3.73	+4.00	+3.86	+3.96	+4.42	+4.22	+3.43	+0.34	-1.97	-4.46	-4.51	-1.17	+2.25	+4.98	+6.64	+5.59	+4.57	+4.12	+3.25	+3.54	+3.62	+4.16	+3.90

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF DECEMBER 1958.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 9.4	+ 9.2	+ 9.8	+10.0	+10.7	+10.8	+10.3	+ 9.3	+ 6.3	+ 5.9	+ 5.4	+ 6.9	+14.7	+12.1	+13.8	+13.9	+12.3	+11.9	+10.1	+10.7	+10.5	+10.9	+10.8	+12.0
2d	+11.5	+11.7	+12.9	+13.9	+12.7	+13.2	+ 8.9	+11.7	+ 5.5	- 1.0	- 8.0	- 2.9	+ 3.9	+ 9.5	+10.5	+10.2	+ 8.5	+ 7.0	+ 7.2	+ 9.1	+ 8.9	-	-	-
3d	+10.0	+10.7	+10.6	+10.2	+10.5	+11.5	+11.5	+ 8.1	+ 4.0	+ 4.2	+ 3.7	+15.6	+ 7.2	+ 8.3	+11.3	+12.7	+11.7	+10.0	+12.3	+11.9	+13.3	+13.4	+13.9	+12.9
4th	+ 8.1	+ 9.7	+10.9	+11.5	+12.2	+12.5	+12.2	+11.3	+ 7.9	+ 4.3	+ 2.6	+ 4.3	+ 8.3	+ 9.9	+ 7.9	+12.6	+16.2	+12.2	+11.8	+12.4	+12.9	+13.2	+13.4	+13.2
5th	+13.2	+13.4	+15.9	+16.4	+18.6	+19.2	+19.6	+16.2	+ 6.2	+ 2.9	- 4.0	- 4.2	- 0.5	+ 5.7	+ 0.7	+ 7.9	+16.3	- 1.7	- 0.1	+ 3.2	- 4.7	- 5.6	+ 3.3	- 6.1
6th	- 6.9	- 7.8	- 7.7	- 6.4	+ 3.0	- 1.2	- 1.3	- 0.1	- 1.8	- 1.7	- 4.2	- 7.2	- 5.2	+ 1.4	+ 4.9	+ 6.4	+ 5.0	+ 7.0	+ 5.7	-	+ 5.7	+ 5.8	+ 5.9	+ 5.9
7th	+ 4.9	+ 5.2	+ 6.0	+ 6.0	+ 6.9	+ 7.0	+ 8.1	+ 9.0	+ 8.7	+ 6.6	+ 5.0	+ 5.6	+ 7.8	+12.3	+14.7	+15.8	+13.6	+14.0	+12.4	+11.0	+12.1	+12.3	+11.8	+12.2
8th	+11.2	+11.4	+10.2	+10.7	+12.0	+11.9	+12.4	+11.2	+11.4	+ 7.3	+ 4.1	+ 5.5	+ 4.3	+ 8.3	+11.8	+13.5	+15.5	0.0	- 2.6	- 0.6	+ 0.5	+ 0.3	+ 0.4	+ 0.8
9th	+ 0.6	+ 0.7	+ 1.2	+ 1.1	+ 3.1	+ 1.5	+ 2.7	+ 2.9	+ 1.2	- 1.9	- 6.1	- 6.9	- 3.1	+ 2.1	+ 1.4	+ 1.9	+ 0.5	- 0.5	- 2.1	+ 1.3	+ 0.4	+ 0.1	+ 0.8	+ 0.3
10th	- 0.1	- 0.5	- 0.5	0.0	+ 1.6	+ 2.2	+ 3.2	+ 5.0	+ 2.8	- 1.0	- 5.5	-11.0	- 6.8	- 3.7	+ 0.9	+ 2.1	+ 2.6	+ 2.3	+ 2.4	+ 2.6	+ 0.8	+ 1.5	+ 1.0	- 0.7
11th	+ 0.4	+ 0.4	-	-	-	-	+ 0.7	- 0.1	- 2.3	- 3.5	- 6.7	- 8.6	- 7.2	- 3.0	- 0.2	+ 2.4	+ 4.4	+ 5.2	- 0.2	- 0.1	+ 1.4	+ 2.5	- 4.2	- 1.2
12th	- 3.4	- 1.4	- 0.1	+ 3.6	+ 1.1	- 0.3	- 0.3	- 0.6	- 2.2	- 5.3	- 7.4	- 6.1	- 3.5	- 3.2	- 0.6	- 1.7	+ 0.6	+ 3.8	+ 4.7	+ 3.2	+ 4.3	- 0.4	+ 0.6	+ 4.2
13th	+ 3.0	0.0	+ 0.3	+ 0.8	- 0.9	- 0.2	- 0.9	- 0.8	- 0.5	- 2.5	- 1.9	- 5.0	- 3.2	- 2.0	- 0.1	- 2.4	- 1.0	+ 1.6	+ 4.9	+ 1.0	+ 1.3	+ 0.4	+ 5.8	+ 4.2
14th	+ 2.9	+ 2.1	+ 0.6	+ 3.5	+ 3.2	+ 1.1	- 1.4	- 6.0	-10.0	-12.7	-10.1	- 5.9	- 2.0	+ 1.9	-	0.0	-12.1	- 1.1	+ 1.0	- 2.7	- 2.6	+ 1.3	+ 2.2	- 2.6
15th	- 2.0	- 1.3	+ 0.9	- 0.8	- 0.7	- 2.9	- 3.9	- 5.0	- 4.3	- 5.5	- 6.5	- 5.0	- 1.5	- 5.0	+ 1.6	+ 1.5	+ 3.6	+ 3.7	+ 1.9	- 0.6	- 0.2	+ 2.5	+ 1.9	+ 3.1
16th	+ 2.4	+ 8.3	+ 1.7	- 0.5	+ 0.3	+ 1.9	+ 0.7	- 1.7	- 4.1	- 4.0	- 5.0	- 4.4	- 0.3	+ 2.6	+ 7.3	+ 8.9	+ 6.6	+ 6.5	- 0.7	+ 1.5	+ 2.8	+ 3.4	+ 4.1	+ 2.9
17th	+ 2.9	+ 2.8	+ 3.0	+ 2.2	+ 3.8	+ 1.9	+ 2.8	+ 1.4	- 0.5	- 4.4	- 5.7	- 4.1	- 1.8	+ 1.7	+ 4.5	+ 5.5	+ 5.9	+ 4.1	+ 3.6	+ 4.0	+ 4.6	+ 5.6	+ 6.7	+ 5.5
18th	+ 4.4	+ 4.6	+ 7.1	+ 7.9	+ 7.2	+ 8.7	+11.3	+ 8.8	+ 6.9	- 2.8	- 0.8	- 0.6	+ 3.5	+ 6.5	+ 8.3	+ 4.5	- 0.9	+ 1.3	+ 6.4	+ 1.1	+ 1.3	+ 8.9	+ 2.9	+ 2.3
19th	+ 2.8	+ 4.3	+ 4.9	+ 5.3	+ 5.3	+ 4.7	+ 4.4	+ 2.3	- 1.2	- 3.6	- 4.9	- 6.7	- 3.7	- 4.7	- 2.8	- 1.6	+ 2.3	+ 3.9	+ 9.3	+ 5.9	+ 6.2	+ 6.4	+ 5.7	+ 6.5
20th	+ 8.1	+ 8.2	+ 6.3	+ 6.1	+ 6.4	+ 7.8	+ 7.7	+ 6.7	+ 3.5	- 1.0	- 5.2	- 6.6	- 4.3	+ 0.5	+ 4.1	+ 5.1	+ 7.5	+ 7.3	+ 7.8	+ 9.9	+10.5	+10.4	+10.8	+10.4
21st	+10.6	+11.0	+10.9	+10.8	+10.9	+13.3	+14.3	+12.1	+ 9.0	+ 5.3	- 0.9	- 4.2	- 5.0	- 1.0	+ 2.2	+ 5.8	+ 7.6	+10.6	+ 8.7	+10.6	+ 9.3	+12.4	+11.6	+12.3
22d	+10.1	+12.5	+12.2	+11.7	+11.8	+12.1	+10.9	+ 9.8	+ 4.2	- 3.3	- 8.0	- 6.6	- 4.9	- 3.0	+ 4.6	+ 2.7	+ 6.3	+ 5.3	+ 5.5	+ 8.5	+ 9.5	+11.7	+ 8.3	+ 7.9
23d	+ 8.1	+ 8.5	+ 8.8	+ 8.9	+ 9.0	+12.4	+10.7	+ 7.3	+ 1.1	- 4.5	-	-	-	-	-	-	-	-	+ 9.4	+ 2.1	+ 2.9	+ 8.7	+ 4.7	+ 5.2
24th	+ 4.2	+10.9	+ 7.2	+ 8.0	+ 6.2	+ 5.0	+ 3.1	+ 2.9	+ 0.5	- 5.4	- 4.6	-	-	-	-	-	-	-	-	+ 3.2	+ 3.0	+ 8.8	+ 7.0	+11.7
25th	-13.4	- 8.2	- 8.5	-12.2	-11.2	- 7.0	- 8.1	-10.1	-12.5	-18.2	-23.0	-21.0	-15.1	- 8.8	- 6.2	- 5.0	- 6.2	- 2.0	- 0.4	- 0.3	+ 1.9	+ 2.4	+ 4.2	+ 4.1
26th	+ 1.6	+ 1.7	+ 2.8	+ 2.0	+ 3.5	+ 3.4	+ 2.6	+1.6	- 1.1	- 5.6	-10.7	-15.5	-13.7	-11.5	- 8.4	- 4.9	- 2.6	- 1.8	- 1.4	- 2.8	- 1.7	- 1.4	- 0.3	- 1.0
27th	+ 1.7	+ 2.3	+ 3.4	+ 3.3	+ 4.7	+ 5.1	+ 8.1	-	-	+ 1.1	- 4.5	- 7.1	- 8.9	- 7.9	- 6.7	- 3.2	- 1.3	+ 1.6	+ 1.2	- 0.3	+ 1.5	+ 3.5	+ 1.9	+ 3.0
28th	+ 3.2	+ 2.6	+ 2.3	+ 2.4	+ 2.3	+ 4.0	+ 4.8	+ 5.3	+ 4.3	+ 2.3	- 0.7	- 3.3	- 3.2	- 1.1	+ 0.5	+ 2.5	+ 4.0	+ 4.8	+ 4.5	+ 2.7	+ 3.9	+ 4.9	+ 5.6	+ 5.7
29th	+ 6.0	+ 6.1	+ 5.8	+ 4.0	+ 5.4	+ 5.2	+ 6.5	+ 6.0	+ 5.9	+ 4.0	+ 0.3	- 2.6	- 5.1	- 4.9	- 2.8	- 1.0	+ 1.4	+ 2.4	+ 3.3	+ 3.1	+ 5.0	+ 7.0	+ 6.8	+ 5.9
30th	+ 6.1	+ 5.6	+ 4.7	+ 5.0	+ 5.5	+ 3.7	+ 3.6	+ 0.4	- 5.8	- 4.8	- 3.4	- 7.0	- 6.3	- 6.3	- 6.5	- 4.8	- 4.0	- 9.1	+ 0.9	+ 0.5	- 1.5	- 1.5	- 1.8	- 1.6
31st	- 0.4	+ 1.1	+ 1.5	+ 1.0	+ 1.8	+ 2.2	+ 1.1	- 0.8	- 3.2	- 4.3	- 6.4	- 5.1	- 0.8	- 0.4	+ 1.9	+ 1.4	+ 0.5	+ 2.3	+ 0.3	0.0	- 0.3	- 1.9	- 2.4	- 1.7
Means	+ 3.91	+ 4.70	+ 4.84	+ 4.88	+ 5.56	+ 5.69	+ 5.36	+ 4.13	+ 1.33	- 1.71	- 4.10	- 4.13	- 1.94	+ 0.56	+ 2.70	+ 3.89	+ 4.30	+ 3.88	+ 4.26	+ 3.74	+ 3.98	+ 4.92	+ 4.78	+ 4.58
Normals	+4.88	+5.30	+5.10	+5.18	+5.70	+5.98	+5.35	+4.66	+1.89	-1.34	-4.73	-5.50	-2.85	-0.79	+2.58	+2.80	+3.07	+3.34	+3.38	+3.14	+3.33	+4.69	+4.46	+4.34

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JANUARY 1859.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	-1.5	-0.6	+0.2	+1.5	+1.3	+1.3	+1.0	-1.0	-2.5	-8.0	-11.6	-5.0	-3.6	-3.2	-1.3	+4.6	+6.1	+5.0	+1.8	+1.5	+2.3	+1.0	+0.5	-0.2
2d	-10.8	-1.6	-0.9	-0.3	+0.4	+0.4	-0.5	-2.6	-3.0	-2.9	-3.6	-5.2	-3.1	0.0	+3.1	+5.0	+4.5	+4.5	+4.3	+4.5	+2.3	+3.4	+2.6	+1.2
3d	+0.2	+0.2	+1.2	+0.3	+1.9	+1.7	+2.7	+2.4	+1.8	-1.0	-3.4	-3.4	-1.5	+1.4	+3.7	+5.6	+5.1	+3.5	+2.3	+2.1	+2.7	+3.6	+2.6	+2.4
4th	+0.8	+1.6	+2.6	+3.5	+3.8	+5.4	+5.6	+4.1	+1.4	-1.0	-2.7	-3.1	+1.4	+6.3	+8.8	+9.7	+10.1	+5.6	+2.7	+1.8	+2.4	+2.8	+2.1	+3.3
5th	+4.1	+4.3	+4.6	+5.3	+6.0	+6.9	+7.3	+7.7	+5.1	+2.9	+2.4	+2.2	+1.9	+1.9	+1.9	+3.5	-	-	+2.4	-0.5	+2.5	+2.5	+3.4	+1.1
6th	+2.0	+0.6	-0.2	+1.9	+2.0	+2.4	+1.9	+1.0	-1.4	-3.0	-	-1.9	+1.9	-	+6.0	+6.9	+5.9	+5.8	+2.0	+2.9	+1.9	+1.9	+2.3	+1.2
7th	+0.3	+1.1	+1.5	+1.3	+1.5	+1.6	+1.5	-0.3	-1.8	-3.3	-3.8	-	-1.8	+0.7	+3.4	+3.1	+2.4	+2.7	+3.3	+2.6	+2.5	+4.0	+3.4	+4.1
8th	+4.1	+4.7	+4.0	+4.1	+5.0	0.0	+7.2	-3.1	-4.9	+0.7	-2.4	-3.6	-2.7	-0.7	+4.1	+7.2	+6.1	+4.8	+4.7	+6.7	+7.1	+7.4	+7.1	+6.1
9th	+5.7	+7.1	+7.3	+7.8	+7.5	+7.4	+8.1	+8.0	+6.1	+1.1	-6.5	-9.6	-8.0	-3.7	+1.9	+3.7	+4.5	+4.5	+4.8	+8.7	+8.0	+9.7	+10.7	+7.6
10th	+9.2	+13.9	+9.7	+10.2	+2.7	+13.4	+15.2	+14.6	+11.3	+7.9	+2.7	-4.4	-3.2	-2.1	+5.3	+8.7	+5.8	+11.5	+8.6	-	+5.3	+3.1	+0.9	+2.5
11th	+5.3	-0.6	+0.2	+2.4	+1.4	+1.7	+4.9	+4.4	-2.3	-4.8	-8.4	-12.6	-11.1	-8.9	-0.1	+0.8	+5.8	+6.3	+5.8	+4.5	+7.2	+8.7	+6.0	+2.1
12th	+2.7	+5.7	+2.1	-	+0.6	+1.9	+3.0	+6.2	+3.2	-0.9	-5.4	-7.7	-8.4	-7.2	-9.1	-2.5	+3.9	+2.8	-1.1	+2.7	+5.2	+4.6	+3.3	+5.1
13th	+1.3	+2.1	+3.0	+4.1	+3.8	+3.8	+3.6	+2.1	+1.3	-1.3	-5.2	-7.4	-17.6	-7.1	-6.4	-3.1	+0.7	+2.4	+4.0	+3.4	+2.8	+2.6	+4.1	+4.5
14th	+4.8	+2.5	+3.5	+4.0	+2.0	+3.0	+3.7	+4.5	+2.7	+0.9	-0.6	-3.6	-3.9	-4.5	-5.0	-3.8	-1.6	+0.7	+1.4	+2.1	+2.7	+5.3	+3.8	+3.9
15th	+3.4	+4.7	+4.9	+4.9	+6.0	+7.0	+5.9	+4.3	+2.6	+0.5	-1.3	-3.8	-3.8	-1.1	+2.2	+2.3	+3.1	+3.7	+2.6	+0.1	+2.7	-0.1	-4.0	-6.7
16th	-2.3	-2.0	+8.9	-1.2	-6.2	-3.7	-0.3	+2.2	-2.0	-5.1	-11.2	-11.9	-10.7	-7.6	-6.0	-8.8	-1.6	-5.7	-3.3	-3.1	-0.9	-2.1	-2.4	-0.4
17th	0.0	+0.7	+1.7	+3.8	+8.1	+5.4	+3.5	+4.7	-0.1	-3.6	-8.4	-3.3	-21.7	+11.6	-5.4	-1.6	+4.3	+0.7	+11.1	+0.8	+1.2	+2.4	+3.0	+3.2
18th	+0.4	+1.3	+1.8	+3.8	+4.5	+5.2	+4.5	+2.9	+1.2	-1.3	-2.8	-5.6	-6.4	-1.8	-2.0	-1.1	+3.1	+8.0	+4.4	+3.0	+1.3	-0.9	+1.8	-3.1
19th	-1.2	-3.4	-1.5	-0.2	+0.7	+0.8	-0.7	-3.2	-6.7	-9.1	+1.1	-8.2	-4.5	-1.2	+0.2	+2.4	+6.8	+3.8	+4.1	+3.7	+2.8	+8.6	+4.8	+1.7
20th	+5.5	+4.6	+0.3	-	+1.7	+1.5	+1.9	+2.0	+0.2	-5.5	-11.5	-1.5	-7.8	-4.9	+1.3	+6.6	+8.4	+8.4	+2.4	+1.7	+1.4	+2.0	+1.8	+2.6
21st	+2.1	+2.1	+2.5	+2.9	+3.5	+4.0	+3.3	+0.7	-5.1	-10.9	-13.9	-2.8	-9.4	-2.2	+1.1	+4.9	+4.2	+2.5	+3.4	+1.6	+3.5	+4.8	+3.0	+1.1
22d	+4.6	+1.1	+0.2	+1.6	+1.1	+2.1	+3.8	+2.8	-2.0	-4.9	-7.2	-7.7	-4.8	-2.2	+1.8	+6.0	+0.9	+4.7	+1.7	+1.0	-0.6	+1.5	+1.7	+2.0
23d	+1.5	+1.1	+1.0	+1.5	+2.0	+2.7	+3.2	+2.8	+0.6	-23.9	-7.8	-13.9	-11.0	-4.7	-2.4	+2.7	+2.7	+3.4	+3.2	+3.2	+4.2	+4.3	+3.9	+3.9
24th	+5.6	+7.4	+6.3	+4.6	+4.6	+6.4	+7.9	+6.9	+1.5	-6.0	-9.4	-13.8	-13.0	-7.2	-4.0	+0.1	+3.9	+4.9	+5.1	+5.3	+4.3	+4.0	+4.1	+4.2
25th	+3.8	+3.3	+3.6	+3.9	+4.0	+5.3	+7.1	+7.9	+6.2	+1.1	-6.0	-2.8	-9.0	-3.0	+2.3	+7.1	+8.3	+6.7	+5.0	+5.8	+6.9	+7.0	+7.8	+7.0
26th	+6.0	+5.9	+6.4	+7.8	+8.8	+9.0	+10.6	+10.1	+7.7	+2.7	-2.0	-6.9	-3.1	+2.0	+7.5	+10.0	+12.1	+12.9	+12.6	+12.3	+12.5	+13.6	+13.7	+14.2
27th	+14.2	+14.9	+16.1	+16.0	+16.5	+16.4	+19.9	+19.5	+17.5	+11.6	+5.6	-0.8	+1.2	+4.5	+4.2	+10.8	+7.5	+18.4	+15.3	+3.3	+8.3	+2.0	+5.4	+8.3
28th	+10.2	+12.0	+11.1	+10.9	+11.5	+12.6	+14.0	+12.9	+9.1	+1.5	+0.1	-3.0	-5.7	+0.5	+5.0	+10.9	+12.2	+14.7	+7.7	+12.7	+8.6	+11.7	+8.3	+9.0
29th	+10.6	+10.0	+10.8	+11.9	+12.0	+11.9	+9.6	+5.9	+4.2	-0.1	-1.0	-2.5	-1.8	-0.1	+2.4	+3.0	+6.7	+7.6	+8.6	+7.7	+7.2	+7.8	+7.0	+8.9
30th	+10.1	+9.9	+9.7	+10.4	+8.7	+7.6	+6.6	+5.4	+1.2	-3.0	-7.0	-7.1	-3.5	-0.8	+3.8	+9.6	+10.3	+11.3	+11.5	+11.4	+13.2	+13.1	+15.1	+19.4
31st	+14.9	+13.9	+13.8	+15.9	+16.9	+15.5	+5.5	+13.4	+8.4	+5.2	-0.8	-3.5	-1.0	+1.1	+2.8	+5.7	+6.2	+6.2	+6.4	+8.1	+7.8	+10.1	+9.8	+9.0
Means	+3.79	+4.14	+4.40	+4.99	+4.65	+5.18	+5.53	+4.81	+1.98	-2.36	-4.40	-5.48	-5.67	-1.47	+1.05	+3.88	+5.28	+5.74	+4.80	+4.05	+4.49	+4.79	+4.32	+4.17
Normals	+3.55	+2.73	+3.67	+4.17	+4.18	+4.09	+4.37	+3.54	+1.41	-2.15	-4.42	-4.88	-4.41	-2.22	+1.39	+4.61	+5.28	+5.37	+4.72	+3.16	+3.92	+4.20	+3.90	+3.65

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF FEBRUARY 1859.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 8.9	+ 8.1	+ 7.4	+ 8.1	+10.2	+10.0	+10.2	+ 7.9	+ 5.1	0.0	- 3.6	- 4.9	- 3.1	- 0.2	-	+ 4.7	+ 6.3	+ 7.1	+ 8.4	+ 8.9	+ 9.9	+10.1	+10.0	+ 9.7
2d	+ 9.1	+ 9.2	+ 9.4	+ 8.4	+ 9.1	+ 9.7	+ 7.5	+ 7.3	+ 5.1	+ 1.8	- 5.6	- 7.0	- 4.1	+ 0.7	+ 3.2	+ 2.5	+ 6.7	+ 3.9	+ 6.7	+ 5.9	+ 8.2	+ 6.5	+ 6.7	+ 6.9
3d	+ 6.7	+ 7.5	+ 7.9	+ 7.1	+ 5.6	+ 6.4	+ 6.5	+ 5.4	+ 2.3	- 2.0	- 6.8	-10.0	- 9.9	- 7.3	- 4.5	- 2.0	+ 0.4	+ 2.4	+ 2.5	+ 3.3	+ 5.4	+ 5.1	+ 4.7	+ 5.4
4th	+ 5.2	+ 5.9	+ 6.1	+ 6.8	+ 7.4	+ 7.9	+ 8.7	+ 7.7	+ 5.5	+ 0.4	- 4.4	- 7.1	- 5.9	- 1.7	+ 1.3	+ 4.2	+ 5.2	+ 5.1	+ 4.6	+ 4.9	+ 5.3	+ 7.1	+ 5.1	+ 5.5
5th	+ 5.0	+ 6.1	+ 5.8	+ 5.1	+ 5.5	+ 5.4	+ 6.5	+ 8.1	+ 5.1	- 1.8	- 6.1	- 9.8	-10.1	- 8.2	- 2.9	+ 1.3	+ 1.7	+ 2.0	+ 1.9	+ 1.4	+ 2.5	+ 4.0	+ 2.1	+ 4.1
6th	+ 5.3	+ 6.9	+ 6.1	+ 5.3	+ 5.2	+ 6.9	+ 7.5	+ 7.0	+ 3.9	- 1.1	- 5.0	- 6.6	- 3.5	- 0.2	+ 3.7	+ 5.4	+ 4.0	+ 3.8	+ 2.2	+ 4.1	+ 4.0	+ 4.6	+ 4.8	+ 4.3
7th	+ 4.0	+ 3.3	+ 4.1	+ 3.9	+ 4.5	+ 5.4	+ 7.2	+ 6.7	+ 3.8	- 0.3	- 5.2	- 7.1	- 4.8	- 0.2	+ 1.8	+ 5.0	+ 6.6	+ 7.0	+ 6.5	+ 5.2	+ 5.6	+ 5.8	+ 4.5	+ 5.3
8th	+10.6	+ 4.9	+ 4.6	+ 5.4	+ 4.6	+ 6.2	+ 6.5	+ 5.6	+ 4.2	+ 1.7	+ 0.2	- 1.6	+ 1.5	+ 5.6	+ 7.6	+ 8.4	+ 8.0	+ 8.5	+10.6	+ 8.3	+10.5	+ 6.6	+ 3.3	+ 1.3
9th	+ 5.0	+ 4.9	+ 5.2	+ 5.4	+ 4.6	+ 5.6	+ 5.2	+ 5.3	+ 3.8	+ 1.9	+ 1.5	+ 0.6	+ 1.4	+ 3.3	+ 4.5	+10.3	+12.6	+12.0	+11.7	+11.1	+ 9.0	+ 9.6	+ 7.8	+ 8.0
10th	+ 3.2	+ 2.4	-	- 0.1	+ 1.8	+ 5.6	- 7.5	- 5.6	- 8.5	-10.1	-10.6	-31.0	-18.8	-11.1	- 9.1	- 6.6	- 7.9	- 7.7	- 4.2	+ 3.0	- 0.3	+ 0.8	+ 3.1	+ 0.1
11th	+ 1.5	+ 1.3	+ 2.5	+ 3.2	+ 2.9	+ 2.6	+ 4.9	+ 1.8	- 1.3	- 5.9	- 6.5	- 6.5	- 7.6	- 5.8	- 0.7	+ 3.9	+ 3.6	+ 2.2	+ 0.2	+ 2.1	+ 3.0	+ 2.8	- 0.3	+ 3.0
12th	+ 2.7	+ 4.9	+ 2.4	+ 2.2	+ 2.9	+ 3.3	+ 3.6	+ 2.0	- 0.1	- 2.2	- 4.2	- 4.9	- 4.8	- 4.1	- 2.1	+ 1.8	+ 2.3	+ 2.3	+ 2.4	+ 2.6	+ 4.6	+ 5.8	+ 5.8	+ 6.0
13th	+ 6.0	+ 5.9	+ 4.6	+ 6.7	+ 4.2	+ 3.2	+ 5.7	+ 4.8	+ 0.9	- 3.3	- 7.5	- 7.5	- 6.8	- 4.5	- 0.9	+ 2.1	+ 1.1	+ 1.2	+ 4.4	+ 4.5	+ 4.8	+ 4.6	+ 4.8	+ 4.9
14th	+ 5.3	+ 4.3	+ 4.2	+ 5.2	+ 5.2	+ 6.4	+ 7.2	+ 6.4	+ 2.9	- 2.3	- 6.3	-11.0	- 9.6	- 4.1	- 1.3	+ 0.7	+ 4.4	+ 2.9	+ 3.0	+ 4.9	+ 4.7	+ 5.4	+ 3.3	+ 1.3
15th	+ 1.7	+ 7.4	+ 5.0	+ 5.2	+ 5.4	+ 6.4	+ 6.4	+ 5.5	+ 2.5	- 1.1	- 5.5	- 5.5	- 4.7	- 3.2	- 1.4	+ 1.5	+ 6.2	+ 4.5	+ 6.2	+ 6.4	+ 6.4	+ 6.1	+ 6.6	+ 4.4
16th	+ 4.8	+ 5.2	+ 5.6	+ 9.3	+ 7.7	+ 7.8	+ 6.1	+ 5.9	- 3.2	- 1.9	- 5.7	- 7.8	- 6.7	- 5.8	- 4.1	+ 0.2	+ 3.1	+ 4.8	+ 6.9	+ 6.8	+ 7.7	+ 6.9	+ 7.6	+ 8.0
17th	+ 5.4	+ 8.1	+ 9.0	+ 6.8	+ 8.0	+ 8.4	+10.0	+ 7.9	+ 3.5	- 3.0	- 4.2	- 6.9	- 4.8	- 4.6	- 1.5	+ 2.9	+ 7.2	+ 2.9	+ 5.0	+ 5.0	+ 6.0	+ 5.5	+ 9.2	+ 6.6
18th	+ 6.5	+ 7.8	+ 7.0	+ 5.2	+ 6.0	+ 7.3	+ 7.0	+ 7.4	+ 5.6	+ 0.2	- 6.1	- 9.9	-10.6	-11.3	- 9.3	- 5.3	- 0.3	+ 4.2	+ 2.2	+ 4.2	+ 6.3	+ 6.6	+11.1	+ 4.3
19th	+ 3.6	+ 4.7	+ 4.2	+ 6.2	+ 5.8	+ 6.6	+ 7.4	+ 6.2	+ 2.4	- 3.0	- 7.2	- 6.2	- 3.9	- 1.9	+ 0.1	+ 0.9	+ 3.7	+ 4.6	+ 3.6	+ 6.2	+ 4.7	+ 4.3	+ 7.5	+ 4.8
20th	+ 4.5	+ 4.4	+ 4.2	+ 4.4	+ 4.4	+ 4.5	+ 5.0	+ 3.6	+ 2.0	- 0.4	- 1.5	- 1.2	- 0.1	+ 1.6	+ 3.4	+ 3.7	+ 6.1	+ 7.6	+ 6.8	+ 7.4	+ 6.4	+ 8.0	+ 7.3	+ 6.6
21st	+ 7.2	+ 4.6	+ 4.9	+ 4.8	+ 5.7	+ 5.1	+ 6.3	+ 6.4	+ 5.9	+ 3.7	+ 1.1	- 1.6	- 0.8	- 0.5	- 0.4	+ 2.9	+ 4.7	+ 6.4	+ 6.7	+ 6.9	+ 7.7	+ 6.5	+ 6.9	+ 6.2
22d	+ 6.6	+ 6.3	+ 6.0	+ 6.3	+ 6.6	+ 6.1	+ 7.9	+ 7.8	+ 6.9	+ 4.4	+ 1.6	- 0.2	+ 1.6	+ 2.8	+ 3.1	+ 7.0	+ 8.2	+ 7.5	+ 6.6	+ 7.9	+ 7.6	+ 8.0	+ 7.7	+ 7.5
23d	+ 7.0	+ 7.1	+ 7.6	+ 8.0	+ 8.8	+15.0	+15.5	+15.4	+15.4	+ 3.5	- 0.1	+ 4.7	+ 4.8	+ 4.7	+ 4.8	-14.6	- 5.5	- 0.3	+ 0.7	+ 5.6	+ 3.2	+ 3.9	+ 1.7	+ 3.8
24th	+ 1.6	+ 4.0	- 0.5	- 2.7	- 2.1	+14.4	+ 3.5	- 3.8	- 7.1	- 7.7	- 5.9	- 8.7	- 7.9	- 4.1	- 7.0	+ 0.6	- 1.6	- 5.2	- 5.4	-13.4	-10.6	-13.4	-12.0	- 3.2
25th	- 3.4	-12.0	- 7.5	+ 2.6	+ 2.1	+ 1.5	+ 0.3	- 5.8	- 7.6	- 9.8	-11.4	- 9.8	- 9.2	- 9.2	-12.4	- 7.8	- 4.3	- 2.9	- 2.6	- 1.9	- 1.0	- 4.5	- 4.3	- 5.2
26th	- 3.6	- 3.1	- 2.3	- 1.1	+ 0.2	+ 1.2	+ 2.1	+ 1.7	- 1.5	- 5.5	- 8.0	- 7.5	- 3.1	+ 2.0	+ 5.1	+ 8.2	+ 5.9	+ 3.8	+ 0.7	+ 2.1	+ 0.6	- 6.9	- 1.0	- 2.2
27th	-10.3	-10.9	-17.6	- 2.6	- 2.0	- 8.6	- 4.7	- 2.3	- 6.8	-10.7	-12.8	-12.9	- 9.2	- 6.7	- 5.4	- 3.6	- 0.5	- 1.7	0.0	+ 1.0	+ 2.0	+ 4.8	- 0.8	-
28th	- 1.3	- 7.1	- 0.6	- 1.4	+ 0.9	+ 0.3	+ 3.2	0.0	- 2.6	- 7.6	- 9.6	-10.6	-10.9	- 8.2	- 6.2	+ 0.2	- 0.7	+ 0.9	+ 3.7	+ 2.8	+ 1.8	+ 3.6	+ 3.4	+ 2.3
Means	+ 3.88	+ 3.65	+ 3.53	+ 4.42	+ 4.68	+ 5.73	+ 5.56	+ 4.51	+ 1.72	- 2.22	- 5.19	- 7.09	- 5.41	- 2.93	- 1.13	+ 1.37	+ 3.11	+ 3.21	+ 3.62	+ 4.18	+ 4.49	+ 4.22	+ 4.18	+ 4.06
Normals	+ 5.04	+ 5.63	+ 4.82	+ 4.42	+ 4.68	+ 5.59	+ 6.10	+ 5.25	+ 2.73	- 1.26	- 5.19	- 6.62	- 5.29	- 2.62	- 0.32	+ 2.38	+ 3.52	+ 3.63	+ 3.66	+ 4.84	+ 5.05	+ 5.72	+ 5.13	+ 4.26

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MARCH 1859.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.4	+ 1.7	+ 1.5	+ 1.9	+ 2.3	+ 1.9	+ 1.3	+ 1.9	- 1.7	- 6.1	- 6.8	- 7.2	- 5.9	- 3.7	+ 0.4	- 0.8	- 0.8	- 0.5	- 0.5	+ 0.9	+ 1.9	+ 3.4	+ 2.7	+ 13.1
2d	+ 4.6	+ 4.8	+ 3.9	+ 4.6	+ 6.1	+ 5.6	+ 5.2	+ 6.3	+ 3.5	- 2.5	- 7.3	- 7.1	- 5.6	- 4.5	- 3.4	- 1.9	- 0.5	+ 0.4	+ 1.5	+ 2.7	+ 1.1	+ 2.9	+ 3.1	+ 2.6
3d	+ 3.4	+ 2.4	+ 3.3	+ 4.1	+ 4.9	+ 5.6	+ 6.6	+ 6.5	+ 3.8	- 1.4	- 5.5	- 8.3	- 9.2	- 6.8	- 5.3	- 4.1	- 1.6	- 1.6	- 0.2	+ 1.2	+ 4.0	+ 0.9	+ 3.4	+ 5.4
4th	+ 6.1	+ 6.2	+ 5.4	+ 11.4	+ 5.3	+ 5.2	+ 7.9	+ 8.0	+ 5.3	- 6.6	- 3.0	- 3.7	- 1.3	+ 0.4	- 2.1	- 2.7	+ 1.9	+ 4.1	+ 2.2	+ 3.8	+ 3.2	- 2.8	+ 8.0	+ 0.7
5th	+ 3.6	+ 2.8	+ 2.0	+ 3.3	+ 3.3	+ 4.1	+ 6.9	+ 4.0	+ 3.3	- 0.3	- 4.1	- 3.0	- 3.0	- 1.5	- 0.1	- 3.0	0.0	+ 0.9	+ 0.2	+ 2.9	+ 2.8	+ 3.8	+ 3.9	+ 4.1
6th	+ 5.7	+ 8.5	+ 5.8	+ 0.6	+ 4.0	+ 3.5	+ 1.4	+ 3.7	+ 2.7	- 1.9	- 3.4	- 4.1	- 1.8	+ 0.4	+ 2.2	+ 5.3	+ 4.5	+ 3.9	+ 2.8	+ 3.7	+ 3.6	+ 3.2	+ 2.5	+ 4.6
7th	+ 3.9	+ 3.7	+ 3.4	+ 3.7	+ 3.9	+ 4.6	+ 4.3	+ 3.9	+ 1.7	- 2.9	- 6.1	- 6.2	- 3.4	+ 1.0	+ 3.8	+ 6.9	+ 7.2	+ 4.0	+ 5.5	+ 6.4	+ 7.5	+ 5.8	+ 6.0	+ 6.7
8th	+ 8.7	+ 8.2	+ 5.8	+ 5.2	+ 4.6	+ 6.1	+ 6.5	+ 6.7	+ 4.1	- 0.3	- 4.8	- 5.8	- 4.4	- 2.7	- 0.2	+ 2.0	+ 3.8	+ 5.6	+ 7.2	+ 8.2	+ 8.1	+ 6.9	+ 8.7	+ 6.1
9th	+ 5.4	+ 7.1	+ 6.6	+ 6.7	+ 7.3	+ 6.9	+ 7.7	+ 7.5	+ 5.0	+ 0.3	- 5.2	- 7.5	- 8.7	- 6.3	- 2.2	+ 3.7	+ 5.8	-	+ 5.6	+ 6.3	+ 0.9	+ 3.4	+ 6.2	+ 6.5
10th	+ 6.3	+ 6.1	+ 4.4	+ 2.5	+ 5.2	+ 5.4	+ 3.8	+ 5.3	+ 2.3	- 0.7	- 3.1	- 4.3	- 4.2	- 1.3	+ 2.1	+ 3.7	+ 5.9	+ 6.1	+ 7.4	+ 7.2	+ 6.5	+ 5.8	+ 3.8	+ 5.6
11th	+ 6.3	+ 6.4	+ 5.8	+ 7.0	+ 8.8	+ 7.2	+ 6.6	+ 8.2	+ 4.4	- 1.0	- 8.7	- 4.7	- 5.8	- 3.9	- 1.9	+ 3.3	+ 3.8	+ 4.1	+ 4.5	+ 3.6	+ 4.9	+ 4.1	+ 3.0	+ 5.5
12th	+ 5.2	+ 6.9	+ 5.9	+ 5.1	+ 7.0	+ 5.2	+ 5.0	+ 5.2	+ 4.1	+ 0.8	- 5.1	- 7.3	- 7.6	- 3.1	+ 0.2	+ 2.0	-	+ 0.9	+ 2.2	+ 4.2	+ 6.4	+ 6.5	+ 7.0	+ 7.7
13th	+ 7.2	+ 10.9	+ 6.2	+ 7.1	+ 9.4	+ 7.1	+ 6.7	+ 5.4	+ 2.1	- 3.1	- 6.4	- 4.1	- 3.8	- 5.2	- 6.3	- 1.7	+ 1.0	+ 3.9	+ 1.3	+ 2.6	+ 4.8	+ 7.0	+ 5.4	+ 5.9
14th	+ 6.8	+ 5.9	+ 5.9	+ 6.5	+ 6.1	+ 6.5	+ 5.1	+ 6.4	+ 5.1	+ 1.6	- 3.9	- 8.7	- 8.7	+ 3.2	- 4.7	- 1.1	+ 5.0	+ 3.8	+ 5.3	+ 5.7	+ 6.9	+ 5.7	+ 7.6	+ 4.7
15th	+ 3.0	+ 3.9	+ 5.4	+ 6.1	+ 7.1	+ 6.8	+ 8.6	+ 7.8	+ 5.9	+ 2.2	- 2.6	- 3.7	- 4.5	- 2.4	- 0.5	+ 2.8	+ 4.7	+ 4.9	+ 5.7	+ 4.3	+ 4.1	+ 6.6	+ 5.4	+ 13.6
16th	+ 5.6	+ 7.4	+ 6.2	+ 5.6	+ 6.6	+ 5.6	+ 6.4	+ 6.0	+ 4.4	+ 1.5	- 1.3	- 2.7	- 2.3	- 0.2	+ 3.7	+ 5.7	+ 9.3	+ 5.8	+ 1.8	+ 0.9	+ 0.8	+ 1.7	+ 1.3	+ 4.9
17th	+ 5.5	+ 14.5	+ 8.4	+ 0.4	+ 6.1	+ 7.9	+ 4.6	+ 3.1	+ 1.3	- 1.9	- 6.0	- 10.9	- 8.9	- 10.6	- 7.9	- 2.9	- 1.1	- 1.5	- 1.2	+ 0.9	+ 3.4	+ 2.2	+ 8.3	+ 1.8
18th	+ 2.7	+ 3.7	+ 3.7	+ 1.6	+ 0.4	+ 3.2	+ 2.8	+ 2.5	+ 0.8	- 2.9	- 6.9	- 7.7	- 4.5	- 5.1	+ 0.8	+ 1.9	- 2.3	- 3.0	+ 1.7	+ 2.2	+ 4.8	+ 2.2	+ 2.4	+ 3.4
19th	+ 2.2	+ 0.6	+ 0.6	+ 1.0	+ 2.8	+ 3.8	+ 4.3	+ 2.7	+ 1.9	+ 0.7	- 3.1	- 4.3	- 6.5	- 3.4	- 1.7	+ 2.3	+ 1.7	+ 2.0	+ 2.0	+ 2.3	+ 2.0	+ 2.3	+ 2.3	+ 3.2
20th	+ 4.2	+ 3.9	+ 4.0	+ 3.0	+ 3.1	+ 4.3	+ 4.1	+ 3.8	+ 2.1	- 0.7	- 2.8	- 2.0	+ 1.0	+ 3.0	+ 6.1	+ 6.6	+ 6.3	+ 4.3	+ 3.5	+ 6.1	+ 5.6	+ 5.5	+ 5.3	+ 4.7
21st	+ 4.3	+ 4.2	+ 4.1	+ 4.3	+ 4.7	+ 5.2	+ 4.7	+ 4.0	+ 2.0	- 0.1	- 2.2	- 1.6	+ 0.5	+ 4.8	+ 8.6	+ 9.3	+ 7.6	+ 5.4	+ 4.2	+ 4.5	+ 5.5	+ 5.7	+ 6.0	+ 5.8
22d	+ 5.5	+ 5.2	+ 5.2	- 1.2	+ 4.8	+ 5.2	+ 6.0	+ 5.6	+ 4.4	+ 1.1	- 3.2	- 1.0	+ 0.8	+ 1.6	+ 1.2	- 0.5	+ 2.6	+ 0.8	+ 3.3	+ 4.8	+ 5.8	+ 5.6	+ 6.2	+ 6.0
23d	+ 5.8	+ 3.9	+ 5.9	+ 5.8	+ 6.9	+ 6.0	+ 7.2	+ 5.8	+ 5.5	+ 2.8	- 0.8	- 2.6	- 2.4	+ 0.9	- 1.0	+ 3.2	+ 4.7	+ 5.6	+ 6.3	+ 7.6	+ 10.3	+ 9.7	+ 9.0	+ 8.9
24th	+ 8.9	+ 9.1	+ 8.6	+ 8.6	+ 8.3	+ 9.0	+ 9.2	+ 9.8	+ 8.6	+ 4.9	+ 0.8	- 1.7	- 1.5	- 0.3	- 1.3	0.0	- 0.2	- 5.4	- 1.5	- 0.6	+ 2.0	+ 5.0	+ 3.2	+ 0.6
25th	- 1.0	- 0.6	+ 1.0	0.0	+ 4.6	+ 2.8	+ 3.3	+ 3.2	+ 2.1	- 1.0	- 2.2	- 1.0	+ 0.3	- 1.0	- 0.2	+ 2.7	+ 2.8	+ 3.2	+ 4.1	+ 4.1	+ 2.9	+ 2.0	0.0	+ 4.0
26th	+ 3.6	+ 3.9	+ 4.3	+ 3.7	+ 3.7	+ 5.5	+ 6.2	+ 6.4	+ 6.6	+ 4.6	- 1.2	- 4.9	- 2.3	- 4.1	+ 0.6	+ 5.6	+ 0.3	0.0	- 2.4	- 0.8	- 4.7	+ 0.7	- 2.7	- 2.4
27th	- 1.1	- 3.2	+ 7.9	+ 4.8	+ 3.9	+ 6.9	+ 5.7	+ 2.4	- 5.8	- 1.9	- 5.4	- 6.4	- 4.1	- 4.5	- 9.1	- 0.1	- 7.1	- 9.5	- 5.1	- 2.1	- 1.1	+ 0.8	- 2.6	+ 2.8
28th	- 1.5	- 1.5	- 1.1	- 0.7	- 0.1	+ 2.0	+ 0.7	+ 2.0	- 3.7	- 7.4	- 9.0	- 8.4	- 6.9	- 5.3	- 10.3	-	- 3.4	- 1.6	- 1.2	- 5.4	+ 1.7	+ 1.8	+ 0.1	+ 3.2
29th	+ 5.7	+ 5.3	+ 3.8	+ 3.5	+ 4.0	+ 6.0	+ 4.7	+ 4.0	+ 2.8	+ 1.9	- 0.7	- 0.9	+ 0.7	+ 2.5	+ 1.5	- 0.8	- 1.1	- 2.9	- 0.5	+ 0.7	+ 2.3	+ 2.7	+ 7.5	+ 1.2
30th	+ 3.0	+ 5.6	+ 4.9	+ 5.5	+ 3.2	+ 6.9	+ 4.9	+ 0.3	+ 5.2	+ 4.9	- 1.6	- 2.4	- 2.1	0.0	- 0.2	+ 0.7	- 1.3	+ 2.8	+ 1.4	- 0.1	+ 3.4	+ 2.4	+ 5.9	+ 4.0
31st	+ 2.0	+ 1.7	+ 3.7	+ 3.1	+ 5.5	+ 2.6	+ 2.3	+ 0.4	- 1.1	- 6.8	- 2.9	- 5.6	- 9.1	- 5.3	- 4.1	- 0.8	- 3.7	- 1.3	+ 1.6	- 1.4	+ 4.5	+ 2.8	+ 1.4	+ 3.8
Means	+ 4.30	+ 4.81	+ 4.60	+ 4.03	+ 4.96	+ 5.31	+ 5.18	+ 4.80	+ 2.86	- 0.72	- 4.02	- 4.83	- 4.04	- 2.04	- 1.01	+ 1.58	+ 1.86	+ 1.51	+ 2.21	+ 2.82	+ 3.74	+ 3.75	+ 4.04	+ 4.78
Normals	+ 4.30	+ 4.76	+ 4.60	+ 4.03	+ 4.96	+ 5.31	+ 5.18	+ 4.80	+ 3.15	+ 0.72	- 4.02	- 4.83	- 4.04	- 1.76	- 0.73	+ 1.58	+ 2.17	+ 1.89	+ 2.21	+ 3.09	+ 4.02	+ 3.75	+ 4.04	+ 4.19

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF APRIL 1859.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.6	+ 5.4	+ 4.6	+ 2.6	+ 1.8	+ 2.5	+ 6.2	+ 0.3	+ 2.6	- 2.3	- 5.5	- 4.2	- 2.3	+ 2.0	+ 4.8	+ 5.3	0.0	+ 3.5	+ 3.0	- 1.7	- 2.0	- 6.6	- 1.2	- 2.1
2d	+ 2.5	+ 0.1	+ 0.4	+ 2.1	- 0.9	- 0.3	+ 0.8	+ 2.5	+ 0.8	- 4.1	- 8.8	- 3.3	+ 1.5	+ 2.8	+ 4.7	+ 4.7	+ 1.6	+ 2.4	+ 4.5	+ 5.6	+ 6.9	+ 6.6	+ 7.0	+ 6.1
3d	+ 6.8	+ 7.3	+ 7.6	+ 8.3	+ 9.4	+ 7.7	+ 9.8	+ 7.9	+ 5.6	+ 1.6	+ 0.9	+ 1.0	- 0.7	+ 4.4	+ 4.4	+ 4.8	+ 1.1	+ 6.5	+ 8.6	+ 9.7	+ 9.7	+ 10.7	+ 9.7	+ 8.8
4th	+ 8.3	+ 9.9	+ 12.7	+ 9.5	+ 9.6	+ 9.7	+ 10.1	+ 8.7	+ 7.0	+ 5.5	+ 4.6	+ 3.6	+ 3.3	+ 5.2	+ 7.5	+ 9.1	+ 10.4	+ 10.3	+ 10.4	-	+ 10.8	+ 11.2	+ 11.1	+ 10.2
5th	+ 14.0	+ 10.6	+ 12.0	+ 11.4	+ 12.0	+ 11.6	+ 11.6	+ 10.5	+ 9.5	+ 6.6	+ 5.2	+ 7.4	+ 8.3	+ 8.9	+ 7.1	+ 8.6	+ 9.4	+ 0.5	+ 5.1	+ 9.4	+ 8.9	+ 10.0	+ 9.8	+ 11.5
6th	+ 9.7	+ 8.8	+ 4.6	+ 7.6	+ 8.1	+ 9.6	+ 10.7	+ 10.7	+ 9.3	+ 5.8	+ 3.1	+ 4.1	+ 3.9	+ 6.8	+ 10.1	+ 9.7	+ 11.5	+ 10.1	+ 0.4	+ 10.2	+ 9.1	+ 9.5	+ 10.2	+ 9.7
7th	+ 9.4	+ 11.2	+ 9.4	+ 8.7	+ 9.1	+ 8.6	+ 8.7	+ 8.4	+ 6.3	+ 4.5	+ 3.1	- 0.5	+ 0.8	+ 5.7	+ 8.5	+ 3.3	- 5.2	+ 2.4	+ 3.6	+ 3.1	+ 5.4	+ 4.3	+ 5.9	+ 2.3
8th	+ 4.3	+ 2.8	+ 2.5	+ 3.6	+ 3.4	+ 5.1	+ 4.3	+ 5.5	+ 3.8	- 1.5	- 3.1	- 1.9	- 3.0	- 1.7	- 0.8	+ 1.7	+ 1.9	+ 5.0	+ 4.7	+ 6.5	+ 6.6	+ 5.9	+ 6.6	+ 6.4
9th	+ 7.6	+ 8.5	+ 9.8	+ 3.6	+ 3.7	+ 5.1	+ 4.9	+ 6.2	+ 5.2	+ 2.7	- 3.3	- 4.5	- 1.3	+ 1.5	+ 1.2	+ 1.7	- 1.4	- 0.7	- 1.2	+ 1.8	+ 5.5	+ 5.3	+ 5.6	+ 5.7
10th	+ 5.3	+ 5.1	+ 5.7	+ 6.8	+ 7.0	+ 6.3	+ 6.9	+ 5.6	+ 4.9	+ 5.4	+ 4.9	+ 2.9	- 1.0	- 2.0	- 0.2	+ 1.4	+ 3.1	+ 4.6	+ 5.3	+ 6.0	+ 6.0	+ 5.9	+ 4.2	+ 8.0
11th	+ 5.9	+ 5.5	+ 5.7	+ 6.5	+ 6.7	+ 7.1	+ 7.2	+ 7.4	+ 8.0	+ 7.2	+ 6.7	+ 3.4	+ 1.8	+ 4.4	+ 5.8	+ 5.6	+ 5.4	+ 5.7	+ 5.7	+ 6.8	+ 3.0	+ 4.4	+ 6.2	+ 5.9
12th	+ 11.6	+ 8.8	+ 5.7	+ 6.3	+ 5.7	+ 5.9	+ 5.7	+ 6.7	+ 6.5	+ 4.8	+ 3.1	+ 4.5	+ 2.5	+ 1.9	+ 3.2	+ 4.8	+ 4.8	+ 6.8	+ 0.8	+ 5.4	+ 3.8	+ 5.8	+ 6.7	+ 5.7
13th	+ 5.4	+ 6.9	+ 6.7	+ 7.4	+ 7.5	+ 6.4	+ 5.8	+ 5.1	+ 2.9	- 3.6	- 2.2	-	-	- 1.0	+ 0.8	+ 2.2	+ 5.3	+ 5.5	+ 5.1	+ 6.7	+ 7.0	+ 5.5	+ 5.8	+ 6.7
14th	+ 3.0	+ 4.0	+ 4.8	+ 5.2	+ 6.8	+ 4.6	+ 5.6	+ 4.7	+ 2.3	+ 1.4	- 0.3	- 2.2	- 6.1	- 3.9	- 2.8	- 3.2	+ 2.9	+ 2.2	+ 2.7	+ 2.2	+ 4.5	+ 4.5	+ 5.5	+ 5.9
15th	+ 11.3	+ 7.4	+ 6.3	+ 4.6	+ 5.0	+ 5.3	+ 6.1	+ 5.9	+ 5.5	+ 4.4	+ 1.5	- 2.2	- 3.5	- 2.6	- 0.7	+ 0.2	+ 2.0	+ 3.2	+ 4.8	+ 5.4	+ 5.1	+ 4.5	+ 4.0	+ 4.4
16th	+ 4.6	+ 5.5	+ 6.7	+ 5.7	+ 5.7	+ 7.4	+ 7.9	+ 6.1	+ 7.5	+ 5.0	+ 3.5	+ 3.1	+ 0.8	+ 1.4	+ 1.4	+ 3.9	+ 4.7	+ 4.8	+ 3.8	+ 5.3	+ 5.3	+ 7.3	+ 4.8	+ 4.8
17th	+ 4.6	+ 4.7	+ 6.2	+ 5.2	+ 5.3	+ 4.4	+ 4.3	+ 4.7	+ 3.9	+ 0.9	- 1.7	- 0.7	+ 0.3	+ 2.8	+ 5.4	+ 4.1	+ 5.0	+ 6.4	+ 6.3	+ 6.6	+ 6.3	+ 5.6	+ 5.1	+ 5.3
18th	+ 5.8	+ 4.4	+ 4.8	+ 5.2	+ 6.7	+ 7.0	+ 6.2	+ 6.6	+ 5.1	+ 2.3	- 0.6	- 1.0	+ 1.4	+ 2.9	+ 5.8	+ 9.3	+ 8.5	+ 7.1	+ 4.6	+ 1.8	+ 4.8	+ 4.9	+ 4.7	+ 2.9
19th	+ 2.9	+ 2.3	+ 3.9	+ 2.1	+ 2.8	+ 3.9	+ 2.7	+ 5.9	+ 5.8	+ 4.0	+ 2.0	+ 1.5	- 3.3	+ 2.7	+ 2.2	-	+ 5.9	+ 5.8	+ 4.0	+ 5.2	+ 8.8	+ 3.0	+ 3.6	+ 4.8
20th	+ 4.9	+ 4.8	+ 5.0	+ 5.0	+ 5.5	+ 4.3	+ 5.8	+ 6.0	+ 5.6	+ 2.9	+ 0.6	+ 0.1	+ 2.0	+ 4.1	+ 5.6	+ 8.4	+ 7.4	+ 9.2	+ 12.0	+ 12.1	+ 11.0	+ 10.3	+ 9.9	+ 10.1
21st	+ 8.6	+ 9.0	+ 8.0	+ 8.0	+ 8.5	+ 8.9	+ 9.9	+ 8.9	+ 9.1	+ 8.1	+ 6.9	+ 5.9	+ 4.9	+ 3.8	+ 2.6	+ 7.5	-	+ 7.9	+ 6.5	+ 4.1	+ 3.2	+ 1.7	+ 1.3	+ 2.5
22d	- 0.7	+ 2.8	+ 3.7	- 10.6	- 13.2	- 21.3	- 18.7	- 18.2	- 21.0	- 15.7	- 22.9	- 19.7	- 15.8	- 18.7	- 20.4	- 14.2	- 15.0	- 11.9	- 12.9	- 13.6	- 13.9	- 18.4	- 12.2	- 7.0
23d	- 8.2	- 5.7	- 6.9	- 7.9	- 6.8	- 4.2	- 6.7	- 7.9	+ 0.4	- 1.1	- 3.3	- 13.5	- 11.3	- 10.7	- 11.0	- 10.8	- 5.9	- 4.4	- 5.3	- 1.6	+ 2.2	- 2.9	- 0.5	+ 2.1
24th	- 2.3	+ 4.8	+ 1.9	+ 2.4	- 2.9	- 6.2	- 3.9	+ 0.8	- 3.4	- 9.1	- 17.9	- 6.9	- 11.4	- 20.7	- 17.5	- 15.7	- 8.2	- 7.6	- 4.4	- 5.8	+ 3.7	- 3.2	- 4.5	- 2.3
25th	- 2.5	- 4.3	- 2.9	- 2.8	- 2.0	- 4.3	- 2.9	+ 0.3	- 7.6	- 6.1	- 1.6	- 4.3	- 6.6	- 6.7	- 6.4	- 2.3	- 2.4	- 3.7	+ 5.2	- 2.3	- 2.6	- 2.3	+ 4.2	- 1.7
26th	- 9.3	+ 0.2	+ 2.9	0.0	+ 0.3	+ 0.1	- 0.9	+ 1.2	- 0.1	- 1.7	- 4.0	- 4.1	- 4.4	- 3.2	- 2.5	+ 1.2	+ 3.3	+ 2.2	+ 2.7	+ 2.4	+ 2.6	+ 1.3	- 0.1	+ 0.7
27th	- 0.4	- 0.1	- 1.3	+ 1.4	+ 0.1	+ 0.9	+ 8.6	+ 3.8	+ 2.0	+ 1.2	+ 0.2	- 2.8	- 3.8	- 3.1	- 0.1	- 2.2	- 1.8	- 2.5	+ 0.3	+ 0.5	+ 0.5	+ 1.1	+ 0.6	+ 0.3
28th	+ 2.1	+ 2.0	+ 2.2	+ 5.4	+ 2.6	- 0.7	- 1.9	- 1.3	- 2.1	- 3.9	- 2.6	- 3.2	- 4.2	- 2.4	- 3.2	- 2.0	- 0.9	+ 0.4	- 0.3	- 5.7	- 7.9	- 3.7	- 1.8	- 2.7
29th	- 1.1	- 1.8	+ 3.0	+ 0.4	- 1.4	- 1.1	- 0.7	- 1.6	- 1.4	- 8.9	- 21.9	- 8.4	- 4.1	- 2.8	- 7.0	- 8.9	- 7.2	+ 1.3	- 10.7	- 11.8	- 11.7	- 11.0	- 16.4	+ 5.2
30th	- 14.8	- 18.7	- 4.9	- 11.3	+ 3.9	- 0.8	- 3.4	- 13.0	- 15.3	- 21.7	- 21.7	- 22.8	- 17.3	- 12.9	- 13.4	- 11.4	-	- 23.6	- 21.9	- 21.5	- 25.1	- 22.9	- 24.1	- 23.2
Means	+ 3.43	+ 3.74	+ 4.36	+ 3.41	+ 3.67	+ 3.12	+ 3.69	+ 3.28	+ 2.19	- 0.18	- 2.50	- 2.37	- 2.37	- 1.04	- 0.16	+ 0.92	+ 1.65	+ 1.98	+ 1.78	+ 1.82	+ 2.58	+ 1.94	+ 2.39	+ 3.23
Normals	+ 4.38	+ 5.22	+ 4.81	+ 4.65	+ 4.37	+ 4.72	+ 5.85	+ 5.09	+ 4.17	+ 1.68	+ 0.20	- 1.08	- 0.88	+ 0.92	+ 2.37	+ 2.84	+ 3.13	+ 3.28	+ 3.41	+ 4.04	+ 4.76	+ 3.41	+ 4.71	+ 4.28

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MAY 1859.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.7	+ 2.9	+ 3.0	+ 3.8	+ 4.7	+ 6.9	+ 5.8	+ 5.9	+ 6.9	+ 5.5	+ 2.3	+ 3.4	+ 1.4	- 0.6	- 0.9	+ 1.4	+ 3.9	+ 5.2	+ 4.4	+ 5.4	+ 6.1	+ 5.8	+ 4.6	+ 8.4
2d	+ 5.6	+ 5.6	+ 4.9	+ 7.3	+ 6.1	+ 6.8	+ 7.2	+ 8.4	+ 7.7	+ 6.4	+ 4.7	+ 4.7	+ 3.0	+ 1.8	+ 1.8	+ 4.0	+ 2.0	+ 4.2	+ 3.0	+ 5.8	+ 5.0	+ 4.6	+ 6.7	+ 4.0
3d	+ 3.5	+ 3.3	+ 5.0	+ 6.0	+ 7.2	+ 8.2	+ 5.8	+ 7.1	+ 7.4	+ 5.8	+ 3.2	- 0.7	+ 4.0	-	+ 0.9	+ 3.3	+ 6.5	+ 6.9	+ 4.1	+ 5.6	-	+ 6.9	+ 6.8	+ 7.9
4th	+10.9	+ 8.5	+13.6	+ 5.3	+ 5.6	+ 6.2	+ 7.5	+ 7.4	+ 7.9	+ 2.6	+ 6.4	+ 5.3	+ 4.0	+ 3.3	+ 3.8	+ 2.4	+ 8.3	+ 8.4	+ 7.4	+ 7.4	+ 7.2	+ 6.2	+ 6.4	+ 7.2
5th	+ 7.3	+ 6.5	+ 6.1	+ 5.4	+ 6.2	+ 7.0	+ 7.9	+ 8.8	+10.0	+ 9.5	+ 7.2	+ 6.1	+ 2.7	+ 4.3	+ 5.1	+ 3.0	+ 3.2	+ 3.5	+ 6.1	+ 7.9	+ 6.2	+ 2.9	+ 4.4	+ 5.2
6th	+ 5.0	+ 5.2	+ 5.2	+ 5.2	+ 4.3	+ 5.1	+ 5.2	+ 5.0	+ 6.8	+ 5.2	+ 5.2	+ 3.7	- 1.8	- 0.2	+ 0.8	+ 0.3	+ 1.3	+ 3.3	+ 7.1	+ 4.3	+ 7.0	+ 5.6	+ 5.7	+ 2.7
7th	+ 4.0	+ 5.8	+ 5.1	+ 4.8	+ 3.6	+ 6.4	+ 6.9	+ 5.8	+ 5.2	+ 4.4	+ 3.4	+ 4.2	+ 5.2	+ 2.2	+ 2.5	+ 1.3	+ 2.0	+ 2.9	+ 5.5	+ 4.8	+ 4.3	+ 4.0	+ 8.8	+ 3.9
8th	+ 4.1	+ 4.8	+ 4.1	+ 2.5	+ 1.5	+ 2.9	+ 2.6	+ 2.9	+ 4.6	+ 4.8	+ 2.9	- 2.3	- 6.6	- 1.7	- 2.2	- 5.4	- 3.1	- 2.4	-	+ 5.5	+ 4.8	+ 5.5	+ 5.7	+ 5.5
9th	+ 5.9	+ 5.6	+ 6.8	+ 6.7	+ 6.2	+ 5.8	+ 5.7	+ 7.0	+ 7.0	+ 5.8	+ 7.8	+ 7.0	+ 4.6	+ 3.1	- 0.5	- 1.8	- 1.6	+ 1.6	+ 3.4	+ 1.7	+ 4.6	0.0	+ 6.0	+ 5.2
10th	+ 1.6	+ 2.4	+ 3.7	+ 7.2	+ 3.0	+ 3.6	+ 1.9	+ 3.0	+ 4.9	+ 5.6	+ 6.6	+ 6.4	+ 4.5	+ 1.4	+ 0.9	+ 1.5	+ 2.4	- 1.1	+ 3.1	+ 2.8	- 0.2	+ 1.6	+ 0.7	+ 1.3
11th	+ 2.2	+ 1.7	+ 2.2	+ 2.2	+ 1.2	+ 0.6	+ 1.5	+ 2.7	+ 3.6	+ 4.3	+ 3.5	+ 6.3	+ 3.8	+ 1.2	+ 0.2	+ 2.0	+ 4.9	+ 2.8	+ 1.9	+ 2.0	+ 1.3	+ 1.7	+ 2.4	+ 2.1
12th	+ 2.3	+ 3.3	+ 4.5	+ 6.9	+ 4.5	+ 5.0	+ 4.9	+ 5.1	+ 6.7	+ 7.7	+ 5.7	+ 5.2	+ 1.9	- 1.9	- 6.1	- 5.6	- 2.8	- 3.2	- 2.3	- 3.5	- 5.6	- 3.8	- 2.1	- 6.7
13th	- 0.7	- 1.7	+ 0.8	+ 1.0	- 1.4	- 2.7	- 1.2	+ 0.4	- 0.4	- 0.9	+ 1.0	+ 0.4	+ 0.2	- 1.1	- 2.9	- 0.6	+ 1.3	+ 0.4	+ 2.9	- 1.3	- 1.1	- 3.2	- 1.1	- 1.0
14th	+ 0.7	+ 1.7	- 4.1	- 1.8	+ 1.3	- 1.4	- 0.9	+ 0.2	+ 1.6	+ 1.6	0.0	- 2.1	- 3.3	- 4.0	- 4.9	- 4.6	- 3.7	- 2.0	- 2.4	- 0.7	+ 0.3	+ 1.0	+ 1.4	+ 0.9
15th	+ 1.8	+ 2.4	+ 2.3	+ 1.1	+ 2.4	+ 2.3	+ 2.1	+ 1.7	+ 2.6	+ 2.1	+ 0.7	- 1.3	- 1.7	- 1.0	- 1.7	- 1.9	- 1.0	- 0.5	- 0.8	- 1.4	- 1.0	- 0.4	+ 0.4	+ 1.0
16th	- 1.0	+ 3.1	+ 2.7	+ 2.1	+ 1.1	+ 2.1	+ 2.1	+ 4.5	+ 5.8	+ 3.6	+ 2.1	+ 0.3	- 0.7	- 0.8	-	-	-	-	+ 1.7	+ 1.7	+ 2.2	+ 2.3	+ 2.2	+ 2.2
17th	+ 3.0	+ 4.6	+ 3.9	+ 3.8	+ 4.1	+ 4.1	+ 4.6	+ 5.6	+ 4.8	+ 4.1	-	-	- 3.2	- 4.2	-	-	-	+ 3.5	+ 3.4	+ 3.3	+ 3.7	+ 2.5	+ 2.3	+ 1.9
18th	+ 2.7	+ 2.9	+ 4.1	+ 4.2	+ 4.9	+ 5.1	+ 4.8	+ 9.4	+ 7.6	+ 8.3	-	-	-	+ 5.5	-	+ 7.1	+ 8.0	+ 9.5	+ 6.3	+ 5.3	+ 5.0	+ 5.5	+ 6.4	+ 6.4
19th	- 7.3	+ 7.0	+ 6.3	+ 7.0	+ 8.0	+ 8.4	+ 8.9	+10.2	+10.9	+10.7	-	+ 6.6	+ 1.3	+ 0.9	+ 0.5	+ 6.5	-	+ 6.5	+ 6.3	+ 4.8	+ 5.0	+ 6.4	+19.6	+ 1.4
20th	+ 8.1	- 4.9	- 6.5	- 5.9	- 1.8	- 8.1	- 8.1	- 2.0	- 0.9	- 3.2	-	-	- 7.5	- 9.3	- 8.1	-	-	-	- 9.3	- 8.6	- 7.5	- 5.5	- 3.7	+ 1.2
21st	- 2.2	+ 1.3	+ 5.4	+ 0.5	- 2.5	- 1.6	- 1.6	- 1.2	- 2.6	- 7.5	-	-	-	- 1.9	- 5.0	- 3.0	- 3.2	+ 3.1	+ 1.5	- 2.4	+ 2.0	+ 5.0	- 0.5	- 1.1
22d	- 0.7	+ 1.1	+ 3.8	+ 2.5	+ 0.1	+ 1.4	- 0.4	+ 0.1	- 1.1	- 0.7	+ 2.8	+ 2.4	- 2.6	- 4.0	- 3.4	- 3.5	- 0.2	+ 0.1	- 1.8	- 6.4	- 2.9	- 2.4	- 2.3	- 4.2
23d	+ 1.9	- 1.0	- 2.5	- 3.2	+ 3.0	- 3.3	- 1.2	+ 1.2	+ 0.5	- 1.8	- 2.6	- 5.2	- 3.9	- 6.2	- 6.9	- 5.2	- 3.3	- 4.0	+ 0.5	+ 1.1	- 3.6	+ 1.4	+ 0.4	- 1.6
24th	- 3.6	- 4.0	- 4.6	- 3.9	- 4.6	- 5.0	- 3.8	- 2.6	- 1.9	- 1.4	- 1.7	- 0.7	- 2.3	- 3.9	- 3.4	- 1.0	+ 0.5	- 0.1	- 3.9	- 2.1	- 2.2	- 2.7	- 2.9	- 3.3
25th	- 3.1	- 3.5	- 3.6	- 2.3	- 1.6	- 2.1	- 2.1	- 2.4	- 1.7	- 0.4	-	-	+ 1.2	- 2.1	-	-	-	-	+ 0.2	- 1.1	- 4.3	- 7.0	- 8.5	- 4.8
26th	- 5.1	- 5.1	- 3.1	- 2.1	- 0.8	- 0.5	+ 0.6	+ 2.0	+ 1.5	+ 1.7	- 0.1	- 1.5	- 0.6	- 1.3	- 2.1	- 3.8	-	-	+ 2.7	-	+ 2.6	+ 2.1	+ 2.1	+ 1.5
27th	+ 1.3	+ 1.0	+ 3.6	+ 0.9	+ 1.5	+ 0.8	+ 1.0	+ 2.3	+ 1.7	+ 2.2	- 2.7	- 5.3	- 9.0	- 6.7	- 6.8	- 3.9	- 0.1	- 2.7	- 3.4	- 3.8	- 3.9	- 3.9	- 1.6	- 3.8
28th	- 4.5	- 3.9	- 3.9	- 3.1	- 2.2	- 1.5	- 1.1	- 0.8	+ 0.5	+ 0.4	+ 1.2	-	- 0.2	+ 1.4	- 1.3	-	-	- 4.0	- 3.8	- 4.6	- 3.8	- 3.1	- 3.8	- 3.8
29th	- 2.4	- 3.5	- 2.8	- 2.2	- 2.4	- 1.1	- 1.6	- 1.8	- 0.2	+ 2.1	+ 2.3	+ 3.5	+ 0.2	- 1.6	- 5.3	- 3.5	+ 0.7	- 1.6	- 3.8	- 5.8	- 7.5	- 5.7	- 5.5	- 5.7
30th	- 4.5	- 3.6	- 4.8	- 6.8	- 8.1	- 7.2	- 9.1	- 7.7	- 7.2	- 9.7	-	-	-	+ 3.3	+ 3.5	+ 4.3	+ 6.9	-	+10.8	+10.7	+12.0	+ 9.5	+10.4	+11.6
31st	+10.6	+ 8.6	+11.9	+12.1	+12.4	+11.3	+11.2	+11.3	+12.4	+12.9	+13.3	+12.7	+ 8.6	+ 8.2	+ 9.6	+11.2	+13.1	+14.4	+15.4	+12.1	+ 9.7	+ 9.1	+11.5	+11.3
Means	+ 2.12	+ 1.87	+ 2.6	+ 2.17	+ 1.98	+ 2.11	+ 2.16	+ 3.21	+ 3.63	+ 2.96	+ 3.13	+ 2.46	+ 0.11	- 0.53	- 1.18	+ 0.17	+ 1.83	+ 2.10	+ 2.21	+ 1.68	+ 1.51	+ 1.67	+ 2.91	+ 1.83
Normals	+1.52	+1.87	+1.93	+2.42	+1.97	+2.48	+2.61	+3.31	+3.70	+3.43	+2.69	+2.02	+0.14	-0.53	-1.60	-0.27	+1.34	+1.61	+1.83	+1.64	+1.49	+1.96	+2.71	+1.45

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JUNE 1859.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN .	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 9.4	+10.1	+ 8.9	+ 9.8	+ 9.9	+10.0	+10.4	+10.8	+11.2	+10.1	+ 9.3	+ 6.9	+ 6.9	+ 3.9	+ 3.1	+ 5.7	+ 8.1	+ 9.1	+ 9.9	+ 9.8	+ 7.1	+ 7.6	+11.0	+ 8.4
2d	+ 8.0	+ 8.8	+ 8.8	+ 8.7	+ 9.3	+10.5	+ 9.2	+10.7	+10.8	+10.5	+ 9.3	+ 8.8	+ 8.4	+ 6.2	+ 3.1	+ 3.9	+ 6.4	+ 8.3	+10.9	+10.4	+10.5	+ 8.9	+ 8.6	+ 6.6
3d	+ 8.0	+ 6.7	+ 8.3	+ 7.3	+ 9.7	+11.3	+11.4	+11.6	+12.1	+13.7	+11.3	+ 9.3	+ 3.4	+ 5.0	+ 3.8	+ 4.4	+ 6.1	+ 6.8	+10.7	+12.2	+11.0	+10.0	+ 9.7	+ 9.4
4th	+ 8.3	+ 9.9	+ 8.1	+ 7.6	+ 6.8	+ 7.1	+ 8.4	+ 9.0	+ 9.8	+11.3	+ 8.6	+ 5.9	+ 6.6	+ 8.8	+ 8.6	+ 7.8	—	+10.0	+10.8	+ 7.8	+11.4	+ 5.0	+ 6.6	+ 8.9
5th	+ 8.0	+ 6.6	+ 6.1	+ 7.1	+ 7.1	+ 6.6	+ 6.4	+ 7.2	+ 9.4	+10.4	+10.6	+ 8.2	+ 6.1	+10.2	+ 9.8	+ 9.4	+10.3	+ 9.3	+ 8.4	+ 9.3	+ 7.9	+ 7.1	+ 6.2	+ 6.0
6th	+ 6.7	+ 7.1	+ 6.3	+ 6.7	+ 7.7	+ 8.7	+ 8.5	+ 9.1	+ 9.7	+ 7.5	+ 4.2	+ 4.3	+ 5.5	+ 3.7	+ 3.4	+ 7.6	+ 9.7	+11.1	+11.3	+11.1	+11.2	+10.9	+ 8.1	+ 8.2
7th	+ 6.7	+ 6.8	+ 6.3	+ 6.0	+ 7.1	+ 8.6	+ 8.2	+ 8.6	+ 8.6	+ 9.9	+ 9.6	+ 8.2	+ 9.0	+ 5.5	+ 4.0	+ 6.3	+ 9.9	+12.5	+ 9.7	+ 8.0	+ 8.6	+ 9.3	+10.2	+ 9.7
8th	+ 9.4	+10.0	+ 8.7	+ 8.7	+ 9.1	+ 9.4	+ 9.5	+10.6	+11.7	+11.6	+ 8.4	+ 5.8	+ 3.5	+ 5.8	+ 3.2	+ 3.6	+ 4.8	+ 9.3	+ 7.9	+15.9	+ 3.0	+ 0.5	- 3.8	+ 1.2
9th	+ 2.4	- 3.2	- 3.7	- 4.3	+ 3.9	+ 6.4	+ 0.8	- 2.2	- 3.4	- 2.8	- 2.4	- 0.3	- 2.0	- 3.7	-18.9	-10.2	-14.5	-22.3	-16.8	- 2.3	- 7.2	- 6.5	- 5.3	- 4.6
10th	+ 0.1	- 0.1	- 3.4	- 3.6	- 6.4	- 4.5	- 3.4	- 2.0	- 1.0	- 0.7	- 1.8	- 0.7	- 1.4	- 3.1	- 5.2	- 3.1	- 0.9	- 0.1	- 1.1	- 0.1	- 0.4	- 0.8	+ 0.5	+ 0.6
11th	+ 1.0	+ 0.9	+ 1.2	+ 1.3	+ 1.1	+ 2.6	+ 3.4	+ 4.5	+ 2.9	+ 3.6	+ 3.0	+ 2.8	+ 2.0	+ 2.3	+ 3.0	+ 3.1	+ 6.0	+ 2.6	+ 4.1	+ 2.7	+ 1.2	+ 3.2	+ 2.2	+ 1.4
12th	+ 1.1	+ 4.7	+ 2.6	+ 3.1	+ 3.1	+ 4.4	+ 6.4	+ 6.5	+ 5.1	+ 5.8	+ 1.5	+ 4.5	+ 0.6	+ 2.5	+ 3.3	+ 5.1	+ 6.6	+ 4.3	+ 4.2	+ 4.9	+ 2.7	+ 4.0	+ 3.4	+ 2.5
13th	+ 4.1	+ 3.8	+ 4.4	+ 5.6	+ 2.9	+ 4.5	+ 4.3	+ 5.4	—	+ 5.4	+ 4.9	+ 4.3	+ 3.8	+ 3.4	+ 5.6	+ 4.3	+ 5.1	+ 4.7	+ 3.8	+ 4.7	+ 3.5	+ 2.7	+ 2.7	+ 4.5
14th	+ 3.0	+ 2.8	+ 3.5	+ 4.6	+ 4.7	+ 5.6	+ 5.8	+ 5.8	+ 6.0	+ 5.3	+ 4.0	+ 2.3	+ 1.6	+ 1.9	+ 1.8	+ 4.0	+ 4.3	+ 4.1	+ 4.4	+ 4.4	+ 3.3	+ 3.4	+ 3.1	+ 2.4
15th	+ 2.9	+ 2.4	+ 2.3	+ 1.6	+ 2.8	+ 2.8	+ 3.4	+ 3.9	+ 4.6	+ 5.4	+ 4.1	+ 1.0	- 2.1	- 3.0	+ 1.2	+ 2.0	+ 2.9	+ 3.8	+ 5.4	+ 5.5	+ 4.7	+ 5.6	+ 5.3	+ 4.5
16th	+ 2.2	+ 3.8	+ 1.1	+ 2.5	+ 1.5	- 0.4	+ 2.0	+ 5.5	+ 1.8	+ 1.1	+ 1.8	+ 1.9	+10.0	- 2.1	- 1.9	- 4.2	- 4.6	- 8.9	- 6.8	- 4.3	- 4.8	- 6.8	- 9.6	- 5.9
17th	- 0.6	+ 8.3	+ 0.2	- 2.9	+ 3.4	- 4.2	- 4.7	- 2.3	- 6.1	- 8.0	- 2.7	+ 0.3	- 2.6	- 2.5	- 2.4	- 0.5	+ 1.5	- 0.7	0.0	+ 2.5	+ 3.7	+ 3.1	+ 1.8	+ 2.8
18th	+ 0.8	+ 0.6	- 0.1	+ 4.5	+ 3.9	+ 0.2	+ 1.7	- 3.3	+ 2.7	+ 2.6	- 0.7	- 0.5	+ 3.3	- 1.3	- 0.6	+ 1.1	+ 2.1	+ 0.5	+ 1.6	+ 5.4	+ 6.0	+ 5.5	+ 3.4	+ 5.0
19th	+ 2.0	+ 1.0	+ 0.8	+ 0.8	+ 0.7	—	—	—	+ 1.6	+ 4.0	+ 3.7	+ 3.0	- 0.8	- 0.1	- 1.0	+ 0.2	+ 1.4	+ 1.7	+ 3.0	+ 3.3	+ 3.1	+ 2.7	+ 2.3	+ 1.8
20th	+ 1.9	+ 1.9	+ 2.1	+ 2.5	+ 1.7	+ 2.2	+ 2.7	+ 3.8	+ 4.3	+ 3.9	+ 3.0	+ 0.8	- 0.3	- 0.9	- 0.5	- 0.5	+ 2.3	+ 2.3	+ 2.9	+ 3.3	+ 3.3	+ 2.7	+ 2.3	+ 1.9
21st	+ 2.2	+ 1.0	+ 1.1	+ 1.1	+ 1.2	+ 2.3	+ 2.1	+ 1.2	+ 2.5	+ 2.6	+ 1.6	+ 0.9	- 0.2	- 2.1	- 0.4	+ 2.3	+ 4.2	+ 3.8	+ 3.6	+ 5.0	+ 4.9	+ 4.8	+ 3.9	+ 3.0
22d	+ 4.7	+ 3.4	+ 1.6	+ 1.4	+ 0.6	+ 2.3	+ 2.3	+ 2.7	+ 4.0	+ 3.6	+ 2.3	+ 1.6	+ 0.8	+ 0.1	- 0.2	+ 0.1	+ 1.3	+ 2.8	+ 2.6	+ 1.3	+ 0.3	- 0.5	- 0.9	- 0.7
23d	- 0.7	- 0.6	+ 0.6	+ 1.3	+ 1.9	+ 2.8	+ 2.3	+ 1.8	+ 1.6	+ 2.8	+ 1.9	+ 1.2	+ 1.6	+ 2.2	+ 1.6	+ 2.8	+ 4.7	+ 3.3	+ 3.2	+ 2.1	+ 1.2	- 0.3	- 1.2	- 1.3
24th	0.0	- 0.7	- 0.8	- 0.8	+ 0.7	+ 0.3	+ 1.6	+ 2.3	+ 1.9	+ 1.3	+ 1.0	+ 0.8	- 0.6	- 0.1	+ 3.0	+ 4.9	+ 6.9	+ 7.0	+ 8.3	+ 6.2	+ 5.6	+ 4.9	+ 0.9	+ 2.8
25th	+ 3.1	+ 2.2	+ 1.9	+ 1.4	+ 2.1	+ 2.4	+ 3.1	+ 3.4	+ 4.4	+ 4.4	+ 4.4	+ 2.2	+ 4.9	+ 6.5	+ 7.0	+10.5	+11.9	+ 8.7	+ 4.5	- 5.7	- 4.1	- 0.6	- 5.0	- 3.3
26th	- 4.2	- 5.8	- 3.5	- 6.3	- 5.0	- 3.2	- 4.6	- 2.1	- 1.8	- 1.8	- 1.2	- 1.7	- 1.4	- 2.4	- 4.9	- 8.3	- 1.0	- 4.2	- 4.3	- 5.3	- 8.0	- 7.9	+ 1.7	0.0
27th	-10.2	-10.6	-11.2	- 8.3	- 9.7	- 7.7	- 8.6	—	- 1.3	- 7.9	- 3.5	- 2.8	- 3.1	- 4.5	- 4.6	- 9.1	- 6.1	- 5.0	- 1.6	- 2.9	- 3.3	- 1.7	- 2.0	- 3.6
28th	- 3.8	- 2.3	- 3.2	- 3.1	- 2.8	- 3.1	- 3.9	—	- 2.5	- 2.4	- 3.2	- 5.2	- 5.2	- 4.9	- 6.1	- 5.6	- 5.0	- 4.4	- 7.1	- 4.1	- 4.1	- 4.0	- 3.3	- 3.8
29th	- 3.8	- 3.7	- 3.5	- 4.7	- 3.9	- 3.6	- 3.0	- 3.9	- 2.5	- 2.9	- 3.5	- 4.2	- 4.4	- 6.6	- 6.7	- 5.3	- 2.9	- 2.9	- 1.4	- 2.4	- 3.0	- 5.5	- 6.2	- 5.7
30th	- 6.1	- 4.5	- 5.1	- 4.6	- 4.3	- 4.4	- 3.8	- 3.4	- 2.0	- 1.1	- 1.9	- 2.4	- 2.3	- 4.0	- 5.7	- 5.4	- 4.3	- 1.7	+ 0.4	+ 0.1	- 0.7	- 1.9	- 2.0	- 2.3
Means	+ 2.22	+ 2.38	+ 1.68	+ 1.83	+ 2.36	+ 2.75	+ 2.82	+ 3.90	+ 3.66	+ 3.63	+ 3.05	+ 2.24	+ 1.89	+ 0.89	+ 0.21	+ 1.23	+ 2.66	+ 2.53	+ 3.08	+ 3.63	+ 2.62	+ 2.18	+ 1.82	+ 2.00
Normals	+3.00	+3.13	+2.12	+2.21	+3.40	+2.83	+2.93	+3.90	+3.40	+3.83	+2.77	+2.24	+1.61	+0.28	+0.26	+1.78	+4.04	+3.54	+4.65	+3.53	+2.07	+2.91	+1.89	+2.00

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JULY 1859.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	-4.0	-3.3	-3.8	-2.9	-5.0	-2.7	-2.0	-1.0	-0.2	+0.6	+2.2	+2.7	+1.5	-0.7	-2.2	-1.8	+1.4	+1.8	+2.2	+1.4	-0.4	-1.0	-1.4	-2.9
2d	-3.4	-4.0	-4.2	-3.3	-2.8	-1.5	+0.6	+0.7	+1.0	+1.3	+1.0	-10.1	+1.4	-2.7	-3.6	-3.2	+1.7	+0.0	+1.2	+0.7	0.0	-0.7	-1.6	-2.1
3d	-3.0	-3.5	-3.9	-3.1	-2.6	-2.2	-1.7	+0.4	+1.2	+1.3	+1.3	+0.6	-1.2	-1.8	-1.8	-1.0	+0.5	+2.4	+3.1	+1.7	-0.6	-1.2	-2.6	-4.4
4th	-5.1	-3.8	-3.5	-2.5	-1.6	-0.5	+1.6	+2.3	+3.8	+4.6	+5.0	+2.3	-0.1	-3.0	-5.9	-5.6	-3.6	-1.1	+1.2	-1.3	-0.1	-1.3	-1.5	0.0
5th	-2.1	-2.2	-2.0	-2.8	-2.3	-2.5	-1.7	-1.7	-1.3	-1.3	-4.0	-5.0	-6.1	-4.4	-2.3	-1.4	-0.5	+0.3	+1.2	-2.0	-2.9	-1.3	+0.3	-0.8
6th	-	-0.6	-0.3	-1.7	-4.3	-4.4	-3.9	-3.3	-2.1	+2.2	+0.9	+0.7	+2.3	+0.1	-2.3	+0.5	+2.5	+3.1	+3.5	+1.4	+0.6	+0.7	+2.5	+3.9
7th	+2.9	+3.3	+1.8	+2.1	+5.3	+5.1	+4.5	+5.8	+4.8	+4.8	+2.4	+1.6	+0.0	+0.1	-0.6	+0.4	+1.5	-1.9	+1.4	+0.5	+1.2	+0.8	-0.3	+0.6
8th	+2.0	+2.9	-9.1	-6.9	+9.4	+11.9	+14.9	-	+13.0	+14.3	+14.7	+13.8	+2.3	+12.1	+12.9	+13.7	+11.7	+11.4	+13.5	+12.1	+7.9	+5.8	+5.2	+4.5
9th	+3.1	+3.7	+5.1	+5.3	+6.3	+7.2	+7.7	+7.5	+8.2	+6.9	+5.4	+3.0	+0.1	+1.4	+2.8	+5.5	+9.2	+9.3	+11.3	+7.0	+5.8	+5.0	+5.4	+5.1
10th	-	+8.7	+7.1	+7.1	+7.4	+8.6	+10.0	+11.5	+13.4	+13.5	+15.7	+14.5	+10.6	+9.5	+9.2	+9.3	+8.6	+8.0	+7.9	+3.6	-0.1	-0.2	+0.7	+2.3
11th	+7.6	+4.5	+1.2	+3.2	+2.5	+0.2	+0.5	-2.6	+1.5	+5.4	+7.6	+9.5	+13.1	+15.4	+11.1	+6.1	+1.1	+6.5	+0.5	-23.2	+2.0	+1.6	+4.8	+2.4
12th	+1.4	+13.3	+3.9	+10.5	+10.5	+14.8	+7.9	+10.6	-6.5	-17.3	-13.3	-11.0	-13.6	-11.0	-11.1	-9.2	-7.3	-2.0	+2.2	+0.2	+0.4	+6.2	-0.3	+0.3
13th	-2.5	-3.6	-3.3	-5.8	-4.4	-3.3	-0.7	-3.3	-5.3	-2.9	-2.5	+0.8	+3.1	+5.7	+6.9	+9.9	+10.0	+6.3	+3.3	+1.7	+0.4	+2.3	-2.4	+2.4
14th	-1.6	-2.0	-2.1	-2.9	-3.6	-3.1	-1.9	-0.1	-0.8	-0.7	-	+17.3	+2.5	+0.9	+0.2	+1.5	+1.8	+3.0	+3.6	0.0	-1.4	-2.6	-3.5	-4.1
15th	-4.6	-4.0	-4.4	-4.4	-3.7	-3.1	-3.0	-2.5	-0.5	+0.3	+1.8	+3.6	+2.9	+3.4	+2.7	+5.2	+6.2	+4.9	+6.9	+4.7	+2.7	+0.3	-0.3	-1.2
16th	-1.6	-1.6	-1.1	-0.7	+1.5	0.0	+1.9	+3.9	+5.3	+4.7	+4.5	+1.2	-1.2	-3.0	-5.5	-4.3	-1.9	0.0	+1.8	+0.5	+0.1	-1.2	-1.4	-1.7
17th	0.0	-1.2	-2.7	-2.3	+2.1	-1.7	-0.8	+1.0	+2.5	+3.5	+7.5	+6.1	+5.8	+5.7	+5.3	+8.1	+5.4	+7.9	+7.9	+4.1	+2.7	+2.1	+1.7	-0.9
18th	+3.5	+4.3	+3.5	+3.2	+3.7	+3.7	+2.5	+1.5	+1.2	+1.2	+1.4	+7.5	+9.3	+1.3	-2.2	-	+9.7	+3.2	+4.6	-12.2	-18.4	-21.5	-24.3	-18.8
19th	-21.2	-17.1	-15.2	-15.1	-8.9	+0.5	-7.4	-13.5	-16.2	-11.8	-6.6	-0.6	+9.3	-7.4	-8.9	-3.0	-5.2	-4.3	-6.8	-11.9	-1.0	+10.1	-4.0	+1.2
20th	-6.0	-12.9	-10.8	-6.9	-11.6	-6.5	-7.3	-7.9	-7.8	-6.6	-2.9	-3.6	-4.4	-1.6	+0.4	+1.3	-	+6.5	+2.4	+3.0	+3.1	+3.9	+3.6	+3.2
21st	+4.9	+5.4	+5.8	+4.6	+5.4	+6.8	+7.2	+7.8	+9.5	+10.6	+10.3	+7.8	+5.0	+3.4	+3.2	+5.4	+7.5	+8.0	+6.1	+6.4	+4.2	+5.3	+6.5	+6.7
22d	+6.2	+6.7	+6.0	+5.9	+5.6	+6.5	+5.9	+6.1	+7.7	+7.5	+7.1	+5.1	+2.3	-1.0	-0.5	+1.8	+3.1	+3.7	+4.2	+6.1	+6.2	+4.8	+6.1	+6.2
23d	+5.6	+4.8	+3.6	+4.4	+4.8	+4.7	+4.7	+4.7	+6.1	+7.8	+8.8	+7.0	-	+11.1	+1.8	+2.0	+1.8	+1.8	-4.3	-8.4	-7.7	-9.0	-3.8	-4.2
24th	-1.6	+6.0	+3.9	0.0	-1.8	-1.5	-0.4	+0.6	-2.2	-5.2	-4.8	-3.2	-0.4	-1.5	-1.7	-1.5	+0.5	+1.8	+3.0	+2.8	+2.8	+2.4	+1.8	+1.8
25th	+5.2	+3.1	+2.3	+2.2	+2.3	+2.7	+3.3	+4.1	+6.9	+6.9	+5.2	+4.2	+3.5	+4.1	+2.1	+2.4	+0.8	+1.6	+3.1	+0.9	+3.3	+4.9	+3.5	+2.7
26th	+3.6	+3.9	+3.9	+3.1	+2.8	+2.6	+2.8	-6.6	-3.0	+4.6	+0.4	-4.4	-7.5	+5.6	-0.2	+2.3	+0.8	+3.8	+2.5	+1.1	-1.6	-3.3	-0.6	+0.2
27th	0.3	-0.5	-0.2	+0.4	+0.6	+1.3	+2.0	+3.6	+4.4	+6.0	+6.2	+3.3	+2.6	+1.8	+0.3	+2.9	+5.4	+3.6	+1.3	+5.3	+4.8	+7.5	+4.7	+3.8
28th	+3.3	+4.1	+4.1	+4.2	+4.1	+4.6	+4.6	+5.3	+5.1	+5.1	+5.4	+5.0	+3.1	+5.5	+6.2	+9.1	+10.7	+10.2	+10.1	+9.4	+8.2	+7.5	+7.1	+7.3
29th	+7.4	+7.1	+7.0	+7.1	+7.3	+7.7	+8.8	+10.2	+10.9	+9.2	+8.9	+5.5	+10.7	+8.3	+4.2	-5.8	+0.8	+0.5	-0.7	+2.9	+2.4	+2.8	+3.1	+6.4
30th	+3.5	+2.4	+2.6	+3.0	+3.3	+4.1	+5.6	+5.6	+6.6	+7.9	+7.2	+6.2	+4.4	+6.0	+4.0	+3.8	+2.2	+8.8	+5.8	+2.6	+3.1	+1.9	+2.0	+2.8
31st	+5.7	+3.4	+6.3	+1.2	+2.2	+2.9	+3.5	+4.9	+5.2	+5.2	+6.2	+7.5	+8.3	+9.1	+10.2	+10.1	+9.8	+9.2	+7.0	+8.4	+6.9	+4.3	+4.9	
Means	+0.31	+0.88	+0.04	+0.20	+1.11	+2.03	+2.25	+1.85	+2.33	+2.89	+3.43	+3.19	+2.32	+1.97	+1.12	+2.15	+3.09	+3.82	+3.54	+0.95	+1.12	+1.25	+0.49	+0.89
Normals	+1.08	+1.57	+1.29	+0.37	+1.30	+1.53	+2.48	+2.14	+2.62	+4.11	+3.89	+3.18	+2.60	+1.58	+0.45	+2.75	+3.47	+4.09	+3.60	+2.55	+2.09	+2.12	+1.32	+1.55

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF AUGUST 1859.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	- 2.4	- 7.2	- 4.6	- 2.9	- 1.6	- 0.7	- 0.2	+ 0.5	+ 1.7	+ 2.5	+ 4.1	+ 6.6	+ 5.5	+ 2.2	+ 1.6	+ 3.0	+ 5.0	+ 6.4	+ 6.8	+ 4.8	+ 1.6	+ 0.1	- 1.1	- 1.6
2d	- 2.0	- 2.2	- 2.1	- 1.8	- 1.5	- 0.8	-	- 1.3	+ 0.2	+ 1.6	+ 1.8	+ 3.4	+ 4.0	+ 3.4	+ 5.1	+ 7.3	+ 7.9	+ 8.2	+ 8.2	+ 7.9	+ 4.6	+ 2.6	+ 1.4	- 0.1
3d	- 0.9	- 1.1	- 1.3	- 0.8	- 0.2	- 0.7	+ 0.6	+ 3.6	+ 6.4	+ 8.2	+ 8.2	+ 6.4	+ 3.8	+ 2.1	+ 0.7	+ 2.9	+ 4.5	+ 5.7	+ 5.6	+ 4.8	+ 3.8	+ 3.1	+ 3.2	+ 3.2
4th	+ 3.5	+ 3.8	+ 4.4	+ 4.2	+ 5.2	+ 4.7	+ 5.0	+ 5.1	+ 5.9	+ 4.7	+ 2.3	+ 0.5	- 3.0	- 4.6	- 4.6	- 2.8	+ 0.1	+ 2.8	+ 4.8	+ 4.9	+ 4.8	+ 4.8	+ 5.0	+ 4.0
5th	+ 3.1	+ 2.6	+ 1.0	+ 0.7	+ 2.0	+ 3.5	+ 5.1	+ 6.1	+ 7.6	+ 7.8	+ 8.2	+ 7.8	+ 8.7	+ 5.4	+ 4.6	+ 3.5	+ 7.3	+ 7.7	+ 6.2	+ 6.5	+ 5.0	+ 4.8	+ 3.3	+ 4.4
6th	+ .2	+ 3.9	+ 4.1	+ 4.1	+ 3.3	+ 4.1	+ 5.0	+ 6.1	+ 6.8	+ 6.8	+ 5.7	- 6.0	- 6.2	+ 2.3	+ 1.7	+ 0.3	+ 1.2	+ 1.5	+ 3.3	- 1.9	+ 2.5	+ 2.2	+ 1.7	+ 1.2
7th	+ 0.4	0.0	+ 0.5	+ 1.3	+ 1.8	+ 1.4	+ 1.6	+ 3.0	+ 3.5	+ 3.5	+ 3.3	- 0.9	- 3.9	- 4.2	- 1.7	+ 2.5	+ 5.2	+ 5.6	+ 4.0	+ 3.1	+ 1.0	- 0.4	- 1.1	- 1.9
8th	- 2.5	- 3.3	- 3.5	- 1.7	- 2.5	- 0.9	- 0.2	+ 2.7	+ 3.3	+ 3.3	+ 3.1	+ 3.3	- 0.9	- 3.6	- 4.2	- 3.0	+ 2.3	+ 2.1	+ 0.6	- 0.7	- 1.1	- 1.0	- 0.6	- 4.7
9th	- 1.3	- 0.6	- 0.6	0.0	- 1.3	- 0.6	- 2.1	- 2.4	- 1.5	+ 1.3	+ 2.5	+ 4.2	+ 0.2	- 0.5	- 1.2	- 0.2	+ 2.9	+ 2.5	+ 0.5	+ 1.2	+ 2.0	+ 0.4	- 0.1	- 1.4
10th	- 1.3	- 1.3	- 2.2	- 1.2	- 0.5	+ 0.6	+ 0.6	+ 2.3	+ 1.4	+ 0.5	- 0.3	- 0.3	- 1.4	- 1.8	+ 2.1	+ 2.6	+ 2.4	+ 1.1	- 0.3	- 1.0	- 5.4	- 7.5	- 5.6	- 2.1
11th	- 1.0	- 4.7	- 3.5	- 0.3	- 2.5	- 1.0	+ 0.7	+ 1.6	+ 2.7	+ 5.4	+ 6.1	+ 7.1	+ 5.5	+ 6.0	+ 6.1	+ 6.6	+ 7.1	+ 7.2	+ 4.4	+ 3.8	+ 1.8	+ 0.2	- 1.1	- 2.7
12th	- 1.4	- 2.6	- 2.3	- 2.6	- 2.0	- 1.2	+ 0.3	+ 1.0	+ 0.1	+ 2.3	+ 2.4	+ 3.3	+ 4.0	+ 3.9	+ 5.8	+ 4.6	+ 4.6	+ 4.3	- 4.2	+ 5.8	+ 4.7	+ 4.2	+ 3.3	+ 2.5
13th	+ 4.7	+ 2.2	+ 3.8	+ 3.9	+ 4.7	+ 5.2	+ 5.6	+ 6.8	+ 5.3	+ 7.4	+ 7.1	+ 5.2	+ 2.1	- 2.0	- 4.8	- 4.3	- 2.3	- 0.2	+ 0.9	- 0.2	- 2.4	- 0.5	+ 0.1	0.0
14th	- 0.4	- 0.9	- 1.5	- 1.6	- 1.9	+ 0.6	- 0.6	+ 1.3	+ 1.3	+ 0.9	- 0.3	+ 0.5	+ 4.5	+ 0.9	+ 1.7	+ 2.7	+ 4.5	+ 3.1	+ 2.6	+ 3.5	+ 3.3	+ 1.9	+ 1.8	+ 2.7
15th	+ 2.4	+ 2.0	+ 1.7	+ 1.7	+ 3.1	+ 2.8	+ 5.2	+ 6.5	+ 7.9	+ 7.8	+ 7.2	+ 7.3	+ 7.5	+ 7.3	+ 6.6	+ 8.2	+ 9.5	+ 8.4	+ 7.4	+ 9.0	+ 7.2	+ 7.9	+ 6.6	+ 6.8
16th	+ 6.3	+ 8.0	+ 8.4	+ 8.5	+ 10.0	+ 8.4	+ 7.3	+ 8.3	+ 9.1	+ 7.4	+ 8.0	+ 6.5	+ 6.7	+ 3.1	+ 0.7	- 0.2	+ 0.9	+ 2.4	- 5.1	+ 2.0	- 15.4	- 7.1	- 2.1	- 4.5
17th	- 4.2	- 5.1	- 4.9	- 3.9	- 2.0	- 0.7	+ 0.4	+ 2.5	+ 2.6	+ 2.9	+ 2.9	+ 2.9	0.0	+ 10.8	+ 1.3	- 5.5	- 1.3	- 0.1	- 5.3	- 4.3	- 5.1	- 2.1	- 7.7	- 1.0
18th	- 5.2	- 6.0	- 4.9	- 3.2	- 2.0	+ 0.6	- 0.9	- 0.6	- 1.9	+ 2.5	+ 3.2	- 3.8	+ 0.3	+ 0.2	+ 1.2	+ 5.3	+ 2.6	+ 1.8	+ 4.2	- 6.2	- 2.7	+ 4.1	- 1.1	- 1.6
19th	+ 0.8	- 0.4	- 0.1	+ 1.1	+ 3.1	- 0.8	+ 3.2	+ 3.7	+ 0.8	+ 4.9	+ 4.4	+ 8.3	+ 5.0	+ 4.3	+ 2.8	+ 2.8	+ 6.2	+ 2.0	+ 2.3	- 0.7	- 2.2	+ 3.2	+ 3.5	+ 5.8
20th	+ 3.3	+ 5.4	+ 5.9	+ 4.3	+ 2.8	+ 10.2	+ 5.2	+ 5.7	+ 3.5	+ 2.8	+ 1.4	+ 3.1	+ 4.6	+ 4.9	+ 8.3	+ 7.1	+ 5.0	+ 3.9	+ 8.3	+ 2.6	+ 8.6	+ 6.5	+ 6.9	+ 3.3
21st	+ 5.6	+ 5.7	+ 8.3	+ 8.7	+ 9.5	+ 9.0	+ 7.2	+ 10.5	+ 9.7	+ 9.1	+ 7.3	+ 6.1	+ 5.5	+ 4.0	+ 5.2	+ 7.3	+ 8.4	+ 10.2	+ 9.8	+ 10.4	+ 12.0	+ 11.0	+ 11.1	+ 11.2
22d	+ 10.9	+ 2.7	+ 12.1	+ 12.5	+ 15.3	+ 11.7	+ 11.6	+ 11.9	+ 13.9	+ 1.7	+ 9.3	- 4.1	+ 0.6	+ 0.1	+ 1.5	+ 4.1	+ 5.9	+ 6.9	+ 5.7	+ 5.0	- 1.2	+ 5.1	+ 3.0	+ 4.1
23d	+ 4.3	+ 5.1	+ 7.3	+ 4.4	+ 6.5	+ 6.7	+ 9.0	+ 11.0	+ 9.0	+ 4.7	+ 5.8	+ 5.1	+ 3.9	+ 2.6	+ 4.7	+ 6.6	+ 7.7	+ 7.8	+ 9.5	+ 9.2	+ 9.1	+ 8.9	+ 7.7	+ 6.0
24th	+ 5.8	+ 5.7	+ 5.1	+ 8.0	+ 7.6	+ 5.4	+ 5.7	+ 7.5	+ 6.4	+ 6.4	+ 7.4	+ 6.1	+ 2.0	+ 6.9	+ 6.3	+ 5.8	+ 2.3	+ 4.4	+ 6.5	+ 7.4	+ 3.8	+ 8.7	+ 5.0	+ 4.7
25th	+ 7.3	+ 9.1	+ 7.4	+ 6.8	+ 6.6	+ 7.2	+ 6.9	+ 7.1	+ 5.4	+ 3.8	+ 2.5	- 1.5	- 2.2	+ 2.1	+ 5.9	+ 8.6	+ 10.1	+ 16.4	+ 5.9	+ 6.8	+ 5.2	+ 5.8	+ 5.0	+ 3.8
26th	+ 5.5	+ 6.2	+ 8.8	+ 10.1	+ 12.8	+ 14.2	+ 14.1	+ 15.2	+ 8.7	+ 24.8	+ 9.8	+ 4.8	+ 1.6	+ 2.9	+ 5.2	+ 7.0	+ 9.5	+ 9.8	+ 10.8	+ 2.0	+ 10.0	+ 8.2	+ 6.6	+ 12.4
27th	+ 6.9	+ 9.2	+ 10.0	+ 9.9	+ 9.8	+ 9.8	+ 11.1	+ 11.5	+ 11.5	+ 7.5	+ 9.9	+ 5.6	+ 1.9	+ 2.9	+ 3.0	+ 5.3	+ 8.4	+ 9.2	+ 8.4	+ 9.6	+ 12.2	+ 10.7	+ 10.6	+ 11.2
28th	+ 10.3	+ 10.5	+ 9.7	+ 9.9	+ 11.9	+ 11.0	+ 11.3	+ 11.8	+ 10.1	+ 8.0	+ 6.1	+ 2.8	+ 0.7	- 0.3	+ 2.1	+ 2.9	+ 4.8	+ 6.4	+ 6.8	+ 19.8	+ 6.0	+ 16.8	+ 9.0	+ 7.7
29th	+ 7.1	+ 9.3	+ 2.4	+ 0.6	+ 4.0	+ 3.0	+ 1.4	+ 5.2	+ 1.1	+ 64.7	- 26.0	- 37.0	- 51.9	- 25.4	- 11.4	- 68.9	- 3.9	- 25.9	- 13.9	-	- 56.9	- 39.9	- 28.9	-
30th	- 46.9	- 38.4	- 23.0	- 30.3	- 23.9	- 21.7	- 19.2	- 17.3	- 16.9	- 16.9	- 17.1	- 18.1	- 19.4	- 14.1	- 11.6	- 9.1	- 8.4	- 6.5	- 3.8	- 2.6	- 1.4	- 3.0	- 1.9	- 2.7
31st	- 4.6	- 4.1	- 3.7	- 2.6	- 1.2	- 0.7	- 0.4	- 2.8	- 2.8	- 2.6	- 2.1	- 3.6	- 5.5	- 7.0	- 2.3	+ 1.2	+ 4.5	+ 4.8	+ 7.1	+ 6.4	+ 5.8	+ 7.2	+ 2.5	+ 2.9
Means	+0.57	+0.43	+1.38	+1.54	+2.48	+2.72	+3.35	+4.32	+3.96	+2.46	+3.04	+1.28	-0.51	+0.48	+1.37	+0.39	+4.03	+3.72	+3.48	+3.96	+1.01	+2.16	+1.48	+2.45
Normals	+1.54	+0.53	+1.26	+1.37	+2.25	+2.56	+3.48	+4.70	+4.34	+4.50	+4.73	+3.60	+1.46	+1.87	+2.26	+3.23	+4.73	+4.69	+5.40	+4.06	+1.84	+3.32	+2.26	+1.44

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF SEPTEMBER 1859.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 5.3	+ 5.4	+ 5.6	+ 5.8	+ 5.6	+ 6.4	+ 4.3	+ 5.5	+ 4.9	+ 5.4	+ 2.0	- 2.2	- 3.7	- 3.1	- 0.7	- 0.4	+ 2.8	+ 5.1	+ 1.3	+ 2.1	+ 2.1	- 0.5	+ 5.6	- 1.1
2d	- 1.1	- 0.9	- 1.5	- 0.3	+ 0.8	+ 2.9	+ 4.5	- 3.3	+ 4.4	+ 3.4	+ 1.3	+ 2.8	- 1.4	+ 2.6	+ 10.1	-	-	- 7.6	- 47.6	- 38.3	- 26.5	+ 1.4	- 58.6	
3d	-	- 72.1	- 37.4	- 43.9	- 39.3	- 35.3	- 28.8	- 29.7	- 29.3	- 25.6	- 13.8	- 24.6	- 23.3	- 19.6	- 9.6	- 4.4	- 1.4	- 1.7	+ 3.8	+ 7.5	+ 11.6	+ 10.4	+ 22.5	- 6.5
4th	- 2.8	- 3.8	- 1.1	- 8.3	- 28.6	- 26.4	- 22.1	- 11.5	- 12.1	- 16.0	- 19.1	- 15.0	- 12.7	- 17.1	- 13.2	- 11.1	- 11.8	- 20.6	- 1.7	+ 0.3	- 5.5	+ 10.1	- 3.0	- 3.3
5th	- 11.7	- 6.6	+ 3.7	- 3.3	- 1.4	+ 1.2	+ 1.0	- 4.3	- 1.7	- 0.8	- 0.5	- 6.1	+ 1.3	- 5.0	+ 1.5	+ 3.8	+ 3.4	+ 15.2	+ 9.4	+ 9.0	+ 6.0	- 6.6	- 14.8	- 11.3
6th	- 6.1	- 4.6	- 6.9	- 12.3	- 3.6	- 2.9	- 2.9	- 9.7	- 2.5	+ 3.4	- 2.6	- 8.7	- 12.3	- 11.3	- 2.9	- 1.3	+ 1.5	+ 2.4	+ 2.0	- 9.6	- 1.7	- 7.0	- 4.1	- 2.3
7th	0.0	+ 0.6	- 1.0	+ 4.3	- 3.9	+ 2.2	- 0.3	+ 3.0	+ 3.5	- 1.3	- 5.5	- 8.1	- 7.4	- 2.8	+ 3.7	+ 6.2	+ 6.1	+ 3.7	+ 1.4	+ 2.4	+ 2.6	+ 3.7	+ 4.9	+ 6.3
8th	+ 5.2	+ 4.4	+ 4.4	+ 4.6	+ 4.1	+ 4.2	+ 4.8	+ 2.5	+ 3.4	+ 9.2	+ 10.3	+ 7.4	+ 3.4	+ 5.8	+ 6.7	+ 7.6	+ 7.5	+ 6.9	+ 3.6	+ 5.5	+ 5.4	+ 6.8	+ 7.4	+ 3.2
9th	+ 0.6	+ 3.0	+ 2.1	+ 2.2	+ 3.1	+ 5.4	+ 3.6	+ 3.9	+ 0.7	+ 8.7	+ 7.3	+ 3.7	+ 0.4	- 2.1	+ 2.4	+ 7.0	+ 9.4	+ 11.7	+ 13.3	+ 14.1	+ 14.2	+ 14.2	+ 13.9	+ 14.0
10th	+ 13.9	+ 15.0	+ 13.5	+ 12.7	+ 13.1	+ 13.3	+ 13.4	+ 12.6	+ 12.9	+ 11.6	+ 8.6	+ 5.3	+ 4.5	+ 5.4	+ 7.5	+ 9.4	+ 12.6	+ 14.0	+ 13.6	+ 13.3	+ 10.8	+ 10.4	+ 11.1	+ 12.4
11th	+ 12.1	+ 12.5	- 12.5	+ 11.6	+ 12.5	+ 14.0	+ 13.1	+ 2.7	+ 11.8	+ 9.1	+ 8.1	+ 3.7	+ 2.2	+ 2.3	+ 3.6	+ 8.4	+ 13.4	+ 13.0	+ 11.8	+ 13.3	+ 9.9	+ 9.7	+ 9.4	+ 9.4
12th	+ 9.6	+ 8.7	+ 9.4	+ 12.4	+ 13.3	+ 10.3	+ 10.7	+ 13.4	+ 11.4	+ 7.5	+ 2.8	+ 1.6	+ 0.3	+ 3.8	+ 2.5	+ 3.2	+ 4.3	- 0.7	+ 2.5	+ 1.2	+ 3.0	+ 3.9	+ 7.7	+ 6.2
13th	+ 8.4	+ 5.2	+ 4.8	+ 4.7	+ 4.8	+ 6.5	+ 8.2	+ 8.8	+ 3.8	+ 5.0	+ 3.1	+ 0.3	- 0.1	+ 0.5	+ 3.0	+ 6.1	+ 0.7	- 6.9	- 4.3	- 2.5	- 0.5	- 1.4	- 0.1	- 0.6
14th	+ 0.2	- 1.5	- 4.9	+ 6.3	0.0	+ 3.3	- 1.1	+ 1.4	+ 2.0	+ 1.8	+ 2.1	- 6.6	- 9.7	- 10.3	- 6.1	- 5.2	- 11.7	- 9.8	- 10.0	- 10.5	- 4.7	- 2.2	- 5.1	- 4.9
15th	- 8.0	- 6.2	- 7.0	- 4.6	- 3.9	- 4.5	- 5.1	- 4.5	- 5.6	- 14.7	- 7.2	- 7.7	- 20.4	- 12.3	- 13.0	- 16.6	- 17.7	- 20.7	- 17.8	- 14.9	- 16.8	- 13.4	+ 0.1	- 7.9
16th	- 9.8	- 12.2	- 14.8	- 12.0	- 10.8	- 7.1	- 6.0	- 5.1	- 6.8	- 7.7	- 7.1	- 4.0	- 4.8	- 6.5	- 7.7	- 6.8	- 6.7	- 8.0	- 9.7	- 10.1	- 7.6	- 8.1	+ 3.1	- 4.6
17th	- 10.7	- 8.7	- 5.9	- 10.0	- 14.5	- 13.7	- 8.6	- 6.6	- 4.5	- 2.3	- 1.0	- 2.8	- 1.6	- 1.9	+ 2.5	+ 0.6	- 3.4	- 7.6	- 10.3	- 5.4	- 6.1	- 5.0	- 4.6	- 1.9
18th	- 5.1	- 5.4	- 4.1	- 4.2	- 4.2	- 6.4	- 0.3	- 0.9	- 0.1	+ 0.5	- 0.8	- 1.8	+ 0.8	- 0.1	0.0	+ 0.8	+ 3.1	+ 1.6	- 1.6	- 4.7	- 9.2	- 3.3	- 3.2	- 1.0
19th	- 1.8	- 4.0	- 5.1	- 3.6	- 1.2	- 2.8	+ 0.1	- 6.5	- 2.9	- 0.6	- 1.4	- 4.2	- 2.1	- 0.1	+ 1.5	+ 9.5	+ 8.1	+ 1.9	- 2.5	- 3.2	- 4.9	- 1.9	- 3.8	- 4.2
20th	- 3.9	- 4.3	- 4.6	- 5.7	- 4.7	- 5.8	- 4.8	- 2.6	+ 2.2	+ 7.0	+ 13.4	+ 11.8	+ 10.9	+ 10.7	+ 11.1	+ 12.5	+ 12.9	+ 13.4	+ 13.4	+ 9.6	+ 15.4	+ 15.8	+ 13.4	+ 14.6
21st	+ 14.9	+ 13.7	+ 14.9	+ 13.8	+ 13.9	+ 13.8	+ 14.7	+ 11.6	+ 12.6	+ 10.0	+ 9.2	+ 8.6	+ 8.4	+ 9.9	+ 13.5	+ 14.7	+ 14.5	+ 13.1	+ 12.8	+ 15.1	+ 15.1	+ 14.3	+ 14.4	+ 15.3
22d	+ 14.4	+ 9.5	+ 14.8	+ 15.6	+ 14.2	+ 12.4	+ 12.9	+ 12.3	+ 10.9	+ 10.1	+ 8.6	+ 7.8	+ 5.8	+ 6.7	+ 11.1	+ 15.7	+ 14.7	+ 15.5	+ 13.1	+ 9.3	+ 10.6	+ 10.8	+ 10.3	+ 10.3
23d	+ 8.2	+ 9.8	+ 10.4	+ 8.6	+ 7.0	+ 7.4	+ 7.5	+ 7.6	+ 9.1	+ 10.8	+ 9.3	+ 8.8	+ 7.4	+ 9.4	+ 12.4	+ 14.1	+ 14.1	+ 13.0	+ 10.9	+ 12.1	+ 12.0	+ 10.6	+ 10.1	+ 9.6
24th	+ 9.5	+ 9.1	+ 8.9	+ 10.4	+ 11.3	+ 10.2	+ 10.3	+ 8.8	+ 7.1	+ 7.1	+ 8.2	+ 9.2	+ 9.8	+ 13.7	+ 14.5	+ 16.9	+ 19.9	+ 16.7	+ 15.0	+ 15.5	+ 14.2	+ 11.7	+ 11.4	+ 10.3
25th	+ 2.6	+ 1.3	+ 5.0	+ 5.6	+ 9.2	+ 7.8	+ 4.2	- 17.1	+ 5.2	+ 10.9	- 1.5	- 5.0	+ 4.7	+ 6.0	+ 4.8	+ 7.7	+ 7.3	+ 8.6	+ 9.8	+ 9.3	+ 4.5	+ 7.6	+ 7.4	+ 6.5
26th	+ 6.9	+ 7.4	+ 8.2	+ 9.3	+ 8.9	+ 9.1	+ 10.1	+ 5.9	+ 5.3	- 0.5	+ 1.9	+ 1.5	- 0.4	+ 2.3	+ 6.3	+ 7.5	+ 8.7	+ 7.5	+ 6.3	+ 4.0	+ 4.0	+ 4.5	+ 4.1	+ 3.2
27th	+ 3.5	+ 3.3	+ 3.1	+ 4.3	+ 4.6	+ 6.0	+ 8.9	+ 4.4	+ 8.1	+ 7.0	+ 5.2	+ 6.0	-	+ 6.3	+ 8.0	+ 9.9	+ 10.2	+ 5.9	+ 3.8	- 1.1	+ 2.4	- 1.5	+ 1.7	+ 2.9
28th	+ 1.3	+ 3.0	+ 3.2	+ 4.6	+ 5.5	+ 5.9	+ 10.3	+ 13.9	+ 14.1	+ 12.0	+ 10.2	+ 8.7	+ 4.4	+ 1.8	+ 7.0	+ 6.6	+ 10.0	+ 12.1	+ 10.1	+ 6.6	-	-	-	-
29th	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+ 0.7	+ 3.1	+ 5.1	+ 5.1	+ 4.1	+ 4.2	+ 5.8	+ 6.0	+ 7.2	+ 7.9
30th	+ 7.3	+ 7.9	+ 7.7	+ 7.7	+ 8.2	+ 8.0	+ 6.9	+ 6.0	+ 3.0	- 0.7	- 4.4	- 4.5	- 4.0	- 1.6	+ 3.0	+ 5.6	+ 8.1	+ 5.9	+ 6.0	+ 8.0	+ 9.0	+ 8.9	+ 9.4	+ 9.1
Means	+ 2.25	- 0.36	+ 0.44	+ 1.25	+ 0.83	+ 1.56	+ 2.40	+ 0.78	+ 2.44	+ 2.42	+ 1.61	- 0.49	- 1.41	- 0.23	+ 2.80	+ 4.45	+ 5.02	+ 4.01	+ 3.42	+ 1.78	+ 2.19	+ 2.83	+ 4.75	+ 1.14
Normals	+ 2.84	- 0.21	+ 0.28	+ 2.18	+ 1.22	+ 4.21	+ 4.45	+ 0.51	+ 2.68	+ 4.24	+ 3.12	- 1.48	+ 0.12	+ 1.01	+ 3.55	+ 5.33	+ 6.34	+ 4.56	+ 3.61	+ 4.25	+ 2.34	+ 4.54	+ 6.23	+ 0.34

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF OCTOBER 1859.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 8.7	+ 8.9	+ 8.6	+ 8.4	+ 8.0	+ 9.8	+ 8.8	+ 8.4	+ 5.6	+ 1.1	- 0.7	- 2.0	- 1.4	+ 0.1	+ 6.9	+ 8.6	+ 10.7	+ 0.8	+ 4.7	+ 7.5	+ 7.9	+ 6.8	+ 9.4	+ 9.3
2d	+ 9.6	+ 8.5	+ 11.4	+ 9.7	+ 10.0	+ 6.4	+ 8.7	- 0.9	- 12.2	- 6.5	- 10.4	- 6.5	- 6.8	- 4.6	- 1.7	+ 0.8	+ 2.6	+ 3.6	+ 1.5	+ 3.0	+ 6.3	+ 5.5	+ 5.8	+ 7.4
3d	+ 4.8	+ 2.6	+ 5.5	+ 1.7	+ 1.4	+ 3.6	+ 9.0	- 2.7	+ 5.5	- 1.4	- 3.6	- 6.7	- 2.6	- 4.0	- 5.0	+ 0.5	+ 1.7	+ 1.2	+ 2.3	+ 3.2	+ 4.2	+ 3.2	+ 3.2	+ 4.9
4th	+ 7.9	+ 5.2	+ 5.3	+ 5.8	+ 6.8	+ 6.7	+ 6.0	+ 6.7	+ 4.1	+ 1.8	- 1.1	- 2.5	- 2.4	- 0.7	+ 1.9	+ 2.6	+ 5.2	+ 3.4	- 1.3	- 2.1	+ 1.0	+ 1.7	+ 5.9	+ 6.9
5th	+ 4.0	+ 5.1	+ 6.6	+ 6.9	+ 3.4	+ 5.4	+ 5.7	+ 5.2	+ 2.8	- 1.1	- 1.7	- 3.5	- 3.2	- 1.0	+ 1.8	+ 4.8	+ 5.9	+ 6.7	+ 7.3	+ 9.3	+ 5.9	+ 7.5	+ 6.1	+ 5.8
6th	+ 17.6	+ 9.8	+ 8.8	+ 8.8	+ 10.3	+ 12.6	+ 12.6	+ 10.9	+ 9.0	+ 6.3	+ 5.2	+ 1.6	+ 1.1	+ 5.8	+ 7.8	+ 9.4	+ 9.6	+ 8.8	+ 10.4	+ 9.8	+ 8.4	+ 9.8	+ 10.3	+ 9.7
7th	+ 9.5	+ 13.9	+ 11.2	+ 10.5	+ 12.8	+ 11.3	+ 11.3	+ 11.4	+ 9.5	+ 7.5	+ 2.4	+ 6.4	+ 6.7	+ 9.0	+ 9.6	+ 8.7	+ 8.6	+ 8.5	+ 9.3	+ 7.5	+ 9.6	+ 9.5	+ 8.9	+ 9.2
8th	+ 10.1	+ 6.0	+ 11.8	+ 8.4	+ 9.0	+ 9.6	+ 10.2	+ 10.0	+ 8.3	+ 5.2	+ 1.1	- 0.4	- 0.8	+ 3.1	+ 5.0	+ 8.0	+ 9.2	+ 8.5	+ 9.0	+ 9.2	+ 10.2	+ 10.0	+ 9.8	+ 11.2
9th	+ 11.8	+ 11.2	+ 12.3	+ 11.1	+ 11.9	+ 11.6	+ 12.0	+ 11.5	+ 9.1	+ 5.1	+ 1.0	- 1.0	- 0.5	+ 2.7	+ 5.9	+ 8.2	+ 10.2	+ 10.9	+ 10.9	+ 10.6	+ 11.1	+ 10.8	+ 10.8	+ 10.8
10th	+ 10.6	+ 10.9	+ 11.0	+ 11.3	+ 11.8	+ 12.3	+ 12.3	+ 11.4	+ 8.2	+ 3.7	- 1.2	- 2.6	+ 0.8	+ 5.0	+ 9.6	+ 12.7	+ 14.2	+ 12.6	+ 12.4	+ 12.6	+ 13.0	+ 12.3	+ 12.2	+ 12.8
11th	+ 12.0	+ 12.1	+ 12.3	+ 13.1	+ 13.8	+ 13.5	+ 14.3	+ 13.7	+ 11.2	+ 7.5	+ 3.8	+ 2.2	+ 2.5	+ 4.2	+ 7.5	+ 10.3	+ 10.8	+ 12.6	+ 14.5	+ 14.7	+ 14.4	+ 12.4	+ 11.4	+ 10.5
12th	+ 10.4	+ 11.0	+ 12.8	+ 12.4	+ 12.8	+ 14.3	+ 16.4	+ 14.9	+ 13.4	+ 11.2	+ 4.9	+ 2.7	- 3.1	+ 1.4	+ 3.1	+ 7.5	+ 7.1	+ 4.2	+ 5.2	+ 4.6	+ 1.5	+ 13.6	+ 13.1	+ 0.9
13th	- 2.8	-	- 62.0	- 66.9	- 45.1	- 75.2	- 60.5	- 57.4	- 50.0	- 42.2	- 36.9	- 38.4	- 34.5	+ 10.1	- 29.7	- 28.2	- 22.1	- 14.0	- 11.0	- 9.9	- 9.3	- 9.2	- 10.0	- 4.0
14th	- 5.6	- 7.2	- 5.3	- 4.2	- 3.3	- 2.0	- 0.2	+ 0.4	- 0.4	- 2.1	- 4.4	- 6.8	- 10.1	- 12.3	- 8.7	- 3.7	+ 0.1	+ 3.1	+ 2.5	+ 2.9	+ 2.5	+ 3.5	+ 0.8	+ 2.3
15th	+ 2.8	+ 2.0	+ 2.4	+ 2.1	+ 3.6	+ 4.4	+ 4.6	+ 4.9	+ 3.4	- 1.4	- 4.8	- 7.5	- 5.7	- 3.0	+ 1.3	- 1.1	+ 3.0	+ 2.7	+ 4.4	+ 3.9	+ 5.0	+ 5.1	+ 4.3	+ 8.9
16th	+ 2.5	+ 6.9	+ 6.9	+ 8.6	+ 7.3	+ 4.7	+ 5.8	+ 4.2	+ 2.7	+ 1.0	- 1.8	- 2.3	- 1.5	- 1.9	- 0.5	+ 4.4	+ 6.4	+ 7.4	+ 4.7	+ 5.3	+ 6.6	+ 9.4	+ 5.0	+ 6.6
17th	+ 8.5	+ 5.4	+ 5.9	+ 6.0	+ 7.5	+ 6.2	+ 5.6	+ 9.6	+ 8.8	+ 4.1	- 0.4	- 8.1	- 6.3	- 2.2	- 1.6	+ 0.8	+ 2.1	+ 4.2	+ 4.9	+ 3.2	+ 8.1	+ 7.6	+ 5.4	+ 5.1
18th	+ 4.7	+ 6.6	+ 6.4	+ 8.2	+ 11.6	+ 12.1	+ 11.5	+ 15.1	+ 2.5	+ 9.8	+ 8.2	+ 1.0	- 2.9	- 5.5	- 3.0	+ 4.9	- 7.6	- 11.9	- 12.8	- 25.0	- 18.0	- 0.1	- 34.6	- 31.2
19th	- 30.1	- 25.5	- 23.5	- 17.0	- 9.3	- 10.1	- 10.0	- 8.1	- 9.3	- 13.1	- 18.3	- 20.2	- 17.4	- 13.3	- 2.5	- 4.9	- 4.1	- 2.0	+ 0.9	+ 0.1	- 3.3	- 6.2	- 7.9	- 4.5
20th	- 6.4	- 7.6	- 3.0	- 2.2	+ 0.4	- 1.9	- 0.6	- 0.1	- 0.9	- 4.2	- 6.9	- 9.2	- 7.0	- 5.6	- 2.8	+ 1.8	+ 3.5	+ 2.4	+ 6.5	- 2.2	- 2.3	- 2.3	- 2.0	- 7.2
21st	- 8.5	- 7.3	- 3.2	- 1.0	+ 0.1	+ 4.2	+ 3.1	- 2.5	- 4.7	- 4.7	- 9.9	- 9.6	- 8.5	- 4.7	+ 2.0	+ 1.5	- 0.1	- 0.4	- 1.5	- 1.7	+ 0.7	+ 15.1	- 7.5	+ 5.8
22d	- 23.6	- 17.7	- 12.9	- 13.0	- 8.2	- 10.6	- 8.8	- 8.3	- 14.9	- 7.4	- 17.3	- 16.8	- 16.4	- 11.9	- 10.4	- 5.7	- 5.3	- 2.9	- 4.4	- 1.6	- 0.3	- 1.3	- 3.5	- 1.5
23d	+ 0.3	- 2.2	- 2.5	- 6.7	+ 0.5	+ 2.8	+ 2.8	+ 0.6	- 2.0	- 3.7	- 3.6	- 3.5	- 3.3	- 2.5	- 1.1	+ 2.2	+ 4.3	+ 3.0	+ 2.7	+ 4.3	+ 3.4	+ 3.7	+ 3.2	+ 2.3
24th	+ 3.7	+ 1.4	+ 2.0	+ 2.4	+ 2.8	+ 1.2	+ 1.3	+ 1.4	+ 0.4	- 1.2	- 4.9	- 6.6	- 3.7	- 0.4	+ 4.1	+ 6.0	+ 6.0	+ 4.5	+ 5.0	+ 4.7	+ 4.8	+ 4.8	+ 4.7	+ 4.6
25th	+ 4.5	+ 4.6	+ 5.0	+ 5.2	+ 5.7	+ 5.9	+ 6.7	+ 6.8	+ 5.1	+ 1.8	- 3.1	- 3.9	- 0.7	+ 1.9	- 3.4	+ 7.5	+ 8.6	+ 7.4	+ 7.0	+ 6.9	+ 7.5	+ 6.7	+ 6.2	+ 6.6
26th	+ 6.8	+ 7.4	+ 8.2	+ 8.5	+ 9.4	+ 8.7	+ 9.3	+ 9.1	+ 6.3	+ 2.8	+ 0.7	+ 3.8	+ 6.4	+ 7.8	+ 10.4	- 0.6	+ 12.4	+ 9.5	+ 7.9	+ 9.1	+ 6.5	+ 5.4	+ 3.0	+ 3.8
27th	+ 4.6	+ 6.3	+ 6.7	+ 6.3	+ 6.8	+ 7.7	+ 7.4	+ 6.5	+ 4.6	+ 2.1	- 1.6	- 2.1	+ 0.9	+ 3.7	+ 6.4	+ 7.9	+ 8.0	+ 7.7	+ 7.1	+ 6.7	+ 7.5	+ 5.9	+ 5.9	+ 6.2
28th	+ 6.2	+ 6.1	+ 7.4	+ 7.4	+ 9.0	+ 7.6	+ 8.4	+ 7.7	+ 5.0	+ 0.7	- 3.8	- 4.0	- 4.4	- 2.4	+ 2.5	+ 4.2	+ 7.4	+ 6.4	+ 6.0	+ 5.7	+ 7.0	+ 7.5	+ 7.7	+ 7.6
29th	+ 6.9	+ 7.3	+ 7.7	+ 8.9	+ 8.4	+ 9.0	+ 8.4	+ 8.0	+ 5.7	+ 4.9	+ 2.9	+ 2.2	+ 0.8	+ 1.6	+ 1.6	+ 3.8	+ 5.1	+ 1.4	- 0.4	+ 0.1	+ 2.4	- 0.5	+ 1.6	+ 0.7
30th	+ 5.1	+ 0.4	- 1.0	+ 0.7	+ 0.2	+ 0.5	- 2.5	- 0.3	- 1.4	- 4.6	- 6.5	- 3.0	- 4.1	- 3.4	- 0.1	+ 3.0	+ 3.1	+ 4.6	+ 4.3	+ 5.2	+ 5.1	+ 3.6	+ 6.1	+ 2.8
31st	+ 3.7	+ 2.8	+ 4.3	+ 8.2	+ 10.4	+ 4.2	+ 4.4	+ 2.3	+ 0.4	- 5.5	- 8.4	- 7.3	- 3.6	- 0.8	+ 2.0	+ 5.4	+ 6.1	+ 6.5	+ 5.5	+ 2.4	+ 4.6	+ 2.4	+ 5.2	+ 4.4
Means	+ 3.23	+ 3.16	+ 2.16	+ 2.44	+ 4.19	+ 3.11	+ 4.00	+ 3.24	+ 1.15	- 0.72	- 3.91	- 4.99	- 4.25	- 0.77	+ 0.61	+ 2.94	+ 4.28	+ 3.92	+ 3.85	+ 3.55	+ 4.26	+ 5.30	+ 3.24	+ 3.83
Normals	+ 6.18	+ 5.59	+ 4.40	+ 5.38	+ 6.51	+ 4.99	+ 6.28	+ 4.37	+ 4.03	- 0.13	- 2.68	- 3.44	- 2.94	- 0.53	+ 1.52	+ 4.66	+ 5.81	+ 4.52	+ 4.65	+ 4.36	+ 5.20	+ 5.59	+ 5.62	+ 5.88

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF NOVEMBER 1859.

Value of a part of division = 0.000149. η

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.6	+ 7.5	+ 9.1	+ 4.8	+ 5.1	+ 8.6	+ 6.6	+ 2.8	+ 0.5	- 2.7	- 6.1	- 8.7	- 7.7	+ 0.4	+ 1.3	+ 2.3	+ 3.9	+ 1.1	- 0.2	+ 2.1	+ 1.1	+ 2.4	+ 1.6	+ 1.0
2d	+ 0.6	+ 0.5	+ 0.5	+ 0.8	+ 1.2	+ 2.2	+ 2.8	+ 0.6	- 3.1	- 7.0	- 11.0	- 10.4	- 7.9	+ 3.8	+ 1.7	+ 1.7	+ 4.3	+ 2.8	+ 2.4	+ 2.6	+ 2.5	+ 2.8	+ 3.0	+ 3.2
3d	+ 4.1	+ 2.0	+ 4.2	+ 3.2	+ 3.4	+ 5.3	+ 3.9	+ 5.6	+ 4.2	- 0.6	- 3.1	- 6.2	- 5.4	+ 1.0	+ 6.9	+ 8.7	+ 2.3	+ 8.2	+ 3.7	+ 5.2	+ 5.3	+ 5.4	+ 6.2	+ 11.4
4th	+ 9.3	+ 6.4	+ 6.6	+ 8.3	+ 13.2	+ 4.1	+ 8.5	+ 6.1	+ 1.2	- 2.2	- 4.3	- 3.0	+ 0.2	+ 3.4	+ 5.5	+ 8.2	+ 9.5	+ 6.5	+ 6.4	+ 6.6	+ 6.6	+ 7.0	+ 6.0	+ 6.2
5th	+ 5.9	+ 5.9	+ 6.2	+ 5.2	+ 5.8	+ 6.7	+ 6.7	+ 7.1	+ 6.6	+ 4.5	+ 2.3	+ 0.8	+ 0.8	+ 3.3	+ 4.4	+ 7.2	+ 7.6	+ 8.4	+ 6.8	+ 8.5	+ 9.4	+ 7.1	+ 6.3	+ 6.0
6th	+ 6.4	+ 5.6	+ 7.6	+ 8.1	+ 7.6	+ 8.0	+ 8.5	+ 7.6	+ 7.4	+ 5.5	+ 2.5	+ 0.8	+ 1.2	+ 3.5	+ 6.2	+ 8.3	+ 10.2	+ 10.1	+ 12.7	+ 7.2	+ 9.8	+ 11.6	+ 10.6	+ 4.3
7th	+ 8.5	+ 5.4	+ 7.2	+ 9.0	+ 6.4	+ 7.8	+ 7.0	+ 5.7	+ 4.4	+ 1.3	- 0.2	- 2.9	- 0.1	+ 5.1	+ 5.4	+ 9.5	+ 4.5	+ 10.7	+ 5.2	+ 5.6	+ 4.5	+ 4.5	+ 7.6	+ 10.9
8th	+ 1.7	+ 1.8	+ 3.1	+ 5.0	+ 5.0	+ 5.3	+ 4.9	+ 3.8	+ 1.1	+ 0.7	+ 0.5	+ 2.2	+ 2.7	+ 4.8	+ 5.8	+ 5.9	+ 5.9	+ 4.8	+ 8.1	+ 6.7	+ 5.9	+ 4.6	+ 9.5	+ 5.6
9th	+ 10.2	+ 5.4	+ 7.6	+ 4.4	+ 2.2	+ 4.3	+ 3.6	+ 4.3	+ 3.5	- 1.1	- 5.6	- 6.2	+ 0.7	+ 1.6	+ 6.4	+ 6.5	+ 5.8	+ 4.1	+ 4.0	+ 4.4	+ 3.9	+ 4.9	+ 4.2	+ 7.2
10th	+ 6.8	+ 4.8	+ 3.7	+ 5.9	+ 6.1	+ 5.5	+ 3.3	+ 3.6	+ 2.1	- 0.5	- 1.2	- 2.0	- 0.8	+ 1.1	+ 3.8	+ 5.5	+ 6.5	+ 4.2	+ 4.2	+ 4.9	+ 3.2	+ 6.8	+ 4.8	+ 8.6
11th	+ 11.1	+ 4.4	+ 11.0	- 5.2	+ 3.9	+ 1.9	+ 0.3	- 6.7	- 11.0	- 11.0	- 5.2	- 4.0	- 1.6	- 3.1	+ 3.9	- 4.3	- 0.1	- 5.7	- 3.5	- 1.9	- 1.5	- 0.3	+ 0.4	+ 0.6
12th	- 0.4	+ 1.4	+ 0.5	+ 1.1	+ 1.0	+ 1.3	+ 0.4	- 1.5	- 2.9	- 3.6	- 4.7	- 5.5	- 2.0	+ 1.4	- 0.9	+ 3.2	- 4.9	- 3.2	- 3.6	- 0.8	- 0.6	- 0.6	- 1.7	- 2.9
13th	+ 3.1	+ 2.3	- 5.1	- 2.1	- 0.2	+ 0.6	- 2.8	- 7.9	- 11.4	- 14.0	- 18.6	- 21.8	- 19.2	- 12.4	- 12.0	- 12.0	- 2.2	- 1.0	- 7.4	- 8.5	- 9.2	- 10.0	- 7.3	- 8.3
14th	-	-	- 11.6	- 5.7	- 2.6	- 5.2	- 4.5	- 7.9	- 6.8	- 16.0	- 14.6	- 14.4	- 6.3	- 6.2	- 9.3	- 4.9	- 4.0	- 1.2	0.0	+ 1.3	- 0.5	+ 0.9	0.0	- 3.4
15th	- 0.1	0.0	- 10.1	- 8.5	- 5.3	+ 3.2	+ 4.1	+ 0.7	- 4.3	- 7.8	- 8.6	- 8.1	- 4.5	+ 1.0	+ 3.2	+ 4.9	+ 4.4	+ 3.2	+ 1.5	+ 2.0	+ 1.7	0.0	+ 2.8	+ 0.8
16th	+ 1.8	+ 0.8	+ 3.9	+ 1.3	+ 2.2	+ 2.4	+ 3.2	+ 3.4	+ 1.3	- 3.0	- 4.9	- 6.2	- 1.4	- 0.6	+ 3.2	+ 4.2	+ 3.6	+ 4.4	+ 2.3	+ 4.8	+ 4.9	+ 4.0	+ 2.9	+ 1.5
17th	- 2.2	- 0.4	- 0.5	+ 1.6	+ 3.4	+ 2.2	+ 3.5	+ 3.2	+ 1.2	- 3.0	- 8.0	- 9.6	- 8.3	- 5.8	- 0.6	+ 0.6	+ 1.7	+ 2.5	+ 0.3	+ 2.3	+ 3.9	+ 3.1	+ 3.5	+ 2.0
18th	+ 2.5	+ 2.3	+ 2.7	+ 2.6	+ 3.1	+ 3.7	+ 4.7	+ 7.5	+ 4.7	+ 0.3	- 2.4	- 4.8	- 1.6	+ 2.1	+ 3.2	+ 5.0	+ 7.6	+ 6.1	+ 8.3	+ 4.8	+ 3.0	+ 4.8	+ 4.9	+ 4.7
19th	+ 4.9	+ 4.5	+ 4.2	+ 4.6	+ 4.6	+ 4.7	+ 6.5	+ 3.9	+ 2.1	- 0.5	- 2.3	- 2.0	+ 0.9	+ 2.7	+ 4.7	+ 5.6	+ 4.8	+ 4.3	+ 4.6	+ 2.1	+ 3.6	+ 2.1	+ 3.1	+ 4.5
20th	+ 7.6	- 1.9	+ 2.3	+ 3.4	+ 2.5	+ 4.7	+ 6.4	+ 4.2	+ 0.1	- 2.4	- 5.0	- 5.7	- 6.6	- 2.4	+ 2.7	+ 3.0	+ 3.7	+ 2.6	+ 2.8	+ 2.7	+ 3.0	+ 2.6	+ 3.2	+ 3.8
21st	+ 3.4	+ 3.0	+ 2.8	+ 3.4	+ 3.1	+ 5.4	+ 5.6	+ 5.0	+ 2.4	- 2.0	- 3.7	- 5.7	- 5.0	- 3.8	- 3.0	+ 0.2	+ 1.1	+ 2.7	+ 1.8	+ 2.1	+ 2.9	+ 3.1	+ 3.7	+ 3.4
22d	+ 3.9	+ 3.6	+ 3.1	+ 4.3	+ 4.1	+ 4.9	+ 3.7	+ 2.4	- 0.5	- 2.0	- 4.4	- 3.4	- 0.3	+ 3.5	+ 5.4	+ 6.1	+ 5.6	+ 3.9	+ 4.1	+ 5.0	+ 4.2	+ 4.1	+ 3.5	+ 3.0
23d	+ 2.6	+ 2.3	+ 2.3	+ 3.4	+ 3.8	+ 3.7	+ 4.2	+ 3.1	- 0.1	- 3.4	- 3.7	- 2.5	+ 0.1	+ 1.1	+ 2.1	+ 4.3	+ 5.1	+ 4.7	+ 4.8	+ 6.4	+ 6.0	+ 3.7	+ 3.5	+ 4.6
24th	+ 3.5	+ 5.0	+ 2.9	+ 4.4	+ 5.6	+ 5.9	+ 5.3	+ 4.3	+ 1.0	- 0.3	- 1.3	- 2.1	- 0.1	+ 1.3	+ 4.0	+ 5.0	+ 6.2	+ 4.9	+ 5.7	+ 5.9	+ 6.3	+ 5.7	+ 5.6	+ 4.2
25th	+ 2.9	+ 4.5	+ 4.7	+ 5.0	+ 4.6	+ 4.8	+ 4.8	+ 2.6	- 0.4	- 3.2	- 3.0	- 2.2	+ 2.9	+ 4.6	+ 6.4	+ 9.1	+ 8.1	+ 10.4	+ 7.5	+ 9.4	+ 6.7	+ 8.4	+ 13.4	+ 7.2
26th	+ 7.4	+ 6.6	+ 6.8	+ 8.2	+ 6.3	+ 6.4	+ 6.8	+ 5.8	+ 3.4	+ 2.0	+ 0.3	- 0.8	+ 1.2	+ 2.6	+ 4.7	+ 6.6	+ 9.1	+ 7.8	+ 8.7	+ 6.8	+ 8.1	+ 6.9	+ 6.2	+ 5.0
27th	+ 5.4	+ 5.0	+ 4.1	+ 5.0	+ 6.0	+ 6.3	+ 7.5	+ 6.9	+ 3.8	+ 0.6	- 1.2	- 1.7	+ 0.5	+ 4.0	+ 7.2	+ 11.7	+ 9.0	+ 6.8	+ 5.8	+ 6.2	+ 7.1	+ 7.5	+ 7.8	+ 6.9
28th	+ 7.0	+ 5.2	+ 8.6	+ 4.4	+ 5.5	+ 6.0	+ 7.0	+ 6.6	+ 4.3	+ 0.7	- 2.7	- 3.0	- 1.3	+ 1.2	+ 3.3	+ 7.2	+ 6.2	+ 6.2	+ 6.5	+ 6.5	+ 7.8	+ 8.0	+ 8.0	+ 7.7
29th	+ 8.2	+ 6.6	+ 8.3	+ 6.8	+ 7.2	+ 8.5	+ 8.9	+ 8.1	+ 9.7	+ 5.4	+ 1.9	- 1.2	- 0.8	+ 2.0	+ 6.7	+ 9.7	+ 10.1	+ 9.1	+ 9.1	+ 8.5	+ 8.1	+ 9.0	+ 8.0	+ 9.0
30th	+ 9.6	+ 7.6	+ 7.4	+ 7.9	+ 8.2	+ 10.1	+ 10.6	+ 9.6	+ 7.0	+ 1.7	- 2.3	- 3.3	- 2.4	- 0.2	+ 0.7	+ 4.9	+ 9.9	+ 9.2	+ 6.2	+ 7.2	+ 7.2	+ 6.8	+ 5.6	+ 3.8
Means	+ 4.80	+ 3.73	+ 3.47	+ 3.35	+ 4.10	+ 4.64	+ 4.73	+ 3.35	+ 1.05	- 2.12	- 4.02	- 4.79	- 2.40	+ 0.63	+ 2.65	+ 4.46	+ 4.85	+ 4.62	+ 3.96	+ 4.22	+ 4.20	+ 4.23	+ 4.56	+ 4.08
Normals	+ 4.80	+ 3.73	+ 4.85	+ 4.44	+ 4.11	+ 4.98	+ 5.05	+ 4.56	+ 1.64	- 0.84	- 3.12	- 3.84	- 1.82	+ 1.08	+ 3.60	+ 5.74	+ 5.51	+ 5.27	+ 4.05	+ 4.66	+ 4.67	+ 4.72	+ 4.67	+ 4.51

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF DECEMBER 1859.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.2	+ 5.4	+ 5.9	+ 5.2	+ 5.7	+ 7.0	+ 6.9	+ 6.5	+ 5.0	+ 0.9	- 0.3	- 2.7	- 2.5	- 2.8	+ 3.2	+ 7.6	+ 4.0	+ 3.9	+ 6.7	+ 2.5	+ 6.1	+ 5.3	+ 4.7	+ 3.7
2d	+ 8.5	+ 7.5	+ 2.8	+ 2.7	+ 3.2	+ 2.5	+ 2.9	+ 3.7	+ 0.4	- 2.2	- 7.6	- 2.7	- 1.2	+ 3.5	+ 4.7	+ 4.0	+ 5.3	+ 5.5	+ 5.6	+ 6.4	+ 6.7	+ 8.1	+ 6.6	+ 5.8
3d	+ 5.7	+ 5.5	+ 6.4	+ 5.7	+ 4.6	+ 4.6	+ 5.6	+ 4.2	+ 2.3	- 0.6	- 2.1	- 2.9	- 2.6	+ 2.4	+ 5.8	+ 9.5	+ 9.7	+ 7.1	+ 6.3	+ 5.8	+ 6.8	+ 12.3	+ 7.7	+ 9.3
4th	+ 8.7	+ 8.2	+ 9.6	+ 8.8	+ 6.7	+ 6.3	+ 7.4	+ 8.2	+ 7.0	+ 3.1	+ 0.7	+ 0.7	+ 2.5	+ 4.7	+ 8.1	+ 11.2	+ 10.8	+ 10.1	+ 11.6	+ 12.4	+ 11.4	+ 10.7	+ 9.3	+ 7.2
5th	+ 7.0	+ 8.0	+ 7.1	+ 7.3	+ 7.1	+ 10.1	+ 8.4	+ 6.2	+ 2.1	+ 0.1	- 0.5	- 0.7	+ 1.3	+ 2.9	+ 4.1	+ 7.6	+ 6.1	+ 6.7	+ 5.1	+ 7.8	+ 7.7	+ 11.1	+ 9.5	- 1.7
6th	- 0.5	- 0.1	+ 1.9	+ 7.9	+ 3.8	+ 10.5	+ 5.0	+ 2.8	- 3.1	- 12.7	- 6.8	- 0.9	+ 3.2	+ 6.4	+ 7.8	+ 8.7	+ 9.1	+ 5.0	+ 7.0	+ 5.0	+ 3.3	+ 3.7	+ 3.0	+ 4.3
7th	+ 4.6	+ 4.9	+ 8.8	+ 9.7	+ 3.8	+ 2.3	+ 0.7	- 1.1	- 3.6	- 13.4	- 11.4	- 6.0	0.0	+ 1.2	+ 5.7	+ 9.9	+ 5.3	+ 1.8	+ 4.9	+ 5.3	+ 4.9	+ 4.7	+ 4.6	+ 3.4
8th	+ 2.2	+ 4.5	+ 8.8	+ 11.2	- 1.4	- 1.3	- 2.2	- 7.3	- 13.5	- 15.3	- 15.2	- 14.2	- 10.2	- 7.0	- 1.4	+ 0.4	- 0.2	+ 0.4	+ 2.8	- 0.5	+ 4.5	- 5.3	- 2.8	- 4.5
9th	- 3.0	+ 2.6	- 3.0	- 4.4	- 4.1	+ 0.2	- 5.1	- 9.1	- 12.5	- 14.8	- 11.2	- 12.8	- 4.3	+ 1.7	+ 1.9	+ 5.4	+ 5.6	+ 2.5	+ 0.4	+ 0.1	+ 2.7	+ 3.4	+ 5.6	+ 1.2
10th	- 4.7	+ 0.5	- 5.0	- 4.2	- 2.3	- 2.3	- 3.5	- 5.8	- 9.1	- 12.4	- 12.1	- 8.9	- 5.1	- 0.8	+ 1.9	+ 2.2	+ 3.3	+ 2.9	+ 2.3	+ 1.2	+ 0.2	+ 1.4	+ 1.2	- 1.1
11th	+ 1.1	+ 0.8	+ 1.4	+ 5.4	+ 7.7	+ 12.8	+ 2.1	- 1.0	0.0	- 5.4	- 8.4	- 9.7	- 1.7	+ 6.2	+ 21.0	+ 13.9	- 1.5	+ 1.1	- 0.4	+ 1.4	- 2.9	- 1.0	- 5.8	- 5.6
12th	- 3.0	- 7.1	- 7.3	- 8.0	- 3.0	- 3.5	- 6.0	- 3.9	- 7.3	- 9.1	- 12.2	- 11.2	- 7.0	- 2.0	- 0.2	+ 2.9	+ 0.2	- 0.4	+ 1.5	+ 0.9	+ 1.1	+ 1.7	+ 1.7	+ 0.6
13th	+ 0.3	- 0.2	+ 0.4	+ 0.5	+ 0.7	+ 1.9	+ 2.5	+ 1.7	- 0.7	- 3.6	- 5.4	- 7.0	- 6.6	- 4.3	+ 0.5	+ 3.2	+ 4.4	+ 11.8	+ 6.7	+ 6.5	+ 13.5	- 8.5	- 13.4	- 28.3
14th	- 32.4	- 25.5	- 22.3	- 19.5	- 6.6	- 17.7	- 10.9	- 19.3	- 21.1	- 25.7	- 27.6	- 25.8	- 20.3	- 18.4	- 18.4	- 10.9	- 3.1	- 5.3	+ 3.5	- 5.5	- 7.0	- 8.2	- 12.7	- 7.6
15th	- 5.0	- 8.5	- 8.4	- 7.7	- 7.4	- 7.4	- 6.3	- 3.8	- 5.1	- 11.2	- 14.7	- 16.8	- 16.8	- 16.6	- 10.5	- 8.0	- 5.5	- 3.1	+ 5.6	- 2.5	- 2.3	+ 3.1	+ 0.2	- 2.9
16th	- 1.8	+ 2.2	- 5.5	0.0	- 1.6	- 1.7	- 0.7	- 2.0	- 4.9	- 5.7	- 6.4	- 8.0	- 7.6	- 6.8	- 2.3	+ 2.7	+ 3.8	+ 6.4	+ 7.2	+ 5.1	+ 7.3	+ 4.6	+ 10.7	+ 7.5
17th	+ 1.5	+ 4.8	+ 11.6	+ 0.4	- 0.1	+ 3.8	+ 3.9	+ 3.4	+ 0.4	- 2.3	- 5.5	- 5.0	- 5.9	- 1.8	0.0	+ 1.4	+ 3.5	+ 3.2	+ 2.6	+ 3.0	+ 3.3	+ 4.1	+ 3.5	+ 3.3
18th	+ 3.1	+ 3.9	+ 3.6	+ 4.8	+ 4.0	+ 3.1	+ 4.0	+ 5.8	+ 3.7	- 0.5	- 2.7	- 4.0	- 4.5	- 1.5	+ 3.8	+ 8.3	+ 5.7	+ 5.8	+ 7.7	+ 5.2	+ 3.9	+ 4.8	+ 4.3	+ 5.7
19th	+ 4.7	+ 5.9	+ 5.3	+ 5.5	+ 6.9	+ 6.5	+ 7.5	+ 6.6	+ 4.7	+ 3.0	+ 1.7	- 0.8	+ 0.5	+ 1.4	+ 6.2	+ 8.3	+ 7.3	+ 6.3	+ 5.3	+ 6.1	+ 7.3	+ 7.3	+ 7.5	+ 7.7
20th	+ 6.8	+ 6.4	+ 6.5	+ 6.5	+ 6.1	+ 6.6	+ 5.0	+ 2.4	+ 1.3	- 2.0	- 0.6	+ 1.0	+ 4.7	+ 9.2	+ 12.3	+ 12.3	+ 8.6	+ 8.8	+ 7.3	+ 4.3	+ 6.8	+ 5.1	+ 2.5	+ 2.5
21st	+ 2.2	+ 2.5	+ 2.8	+ 7.3	+ 4.4	+ 3.6	+ 1.4	- 0.7	- 4.5	- 4.9	- 2.6	- 2.1	0.0	+ 2.7	+ 6.6	+ 8.6	+ 7.9	+ 6.0	+ 6.7	+ 6.1	+ 7.2	+ 7.4	+ 6.0	+ 2.5
22d	+ 6.4	+ 7.4	+ 5.3	+ 5.5	+ 4.8	+ 5.3	+ 3.3	+ 0.1	- 5.9	- 8.2	- 9.1	- 5.9	- 1.9	- 0.2	+ 5.5	+ 6.0	+ 7.4	+ 5.6	+ 5.1	+ 4.6	+ 5.4	+ 7.2	+ 8.2	+ 2.3
23d	+ 6.9	+ 5.8	+ 2.9	+ 0.8	+ 1.5	+ 3.7	+ 3.0	+ 1.5	- 2.2	- 3.1	- 3.7	- 6.1	- 3.4	+ 8.3	+ 6.6	+ 9.1	+ 5.4	+ 10.0	+ 6.5	+ 5.8	+ 4.4	+ 5.7	+ 5.4	+ 3.4
24th	+ 6.1	+ 1.3	- 0.9	+ 2.5	+ 6.4	+ 10.4	+ 4.4	+ 6.0	+ 1.3	- 2.8	- 6.8	- 6.7	- 1.0	+ 1.2	+ 2.8	+ 2.0	+ 2.9	+ 2.8	+ 2.3	+ 4.1	+ 3.7	+ 3.9	+ 4.0	+ 4.4
25th	+ 4.7	+ 4.0	+ 4.6	+ 4.8	+ 5.3	+ 5.6	+ 7.0	+ 4.5	+ 1.4	- 1.6	- 2.7	- 1.1	- 0.8	+ 1.1	+ 1.9	+ 4.6	+ 4.8	+ 6.5	+ 5.9	+ 4.2	+ 5.2	+ 4.6	+ 3.8	+ 3.3
26th	+ 7.7	+ 4.5	+ 3.6	+ 3.3	+ 5.2	+ 6.1	+ 6.2	+ 4.4	+ 1.5	- 1.5	- 2.6	- 3.5	+ 0.4	+ 3.2	+ 8.4	+ 7.6	+ 9.2	+ 8.4	+ 6.3	+ 6.8	+ 6.2	+ 6.9	+ 6.3	+ 5.6
27th	+ 4.9	+ 4.8	+ 3.1	+ 2.1	+ 2.9	+ 4.2	+ 4.9	+ 2.9	+ 2.1	+ 0.7	- 0.8	- 0.6	- 2.0	+ 9.3	+ 7.7	+ 4.9	+ 7.5	+ 3.9	+ 3.2	+ 4.8	+ 4.8	+ 4.5	+ 4.4	+ 4.7
28th	+ 4.3	+ 4.5	+ 4.0	+ 4.1	+ 3.8	+ 4.0	+ 4.0	+ 4.2	+ 0.9	- 2.3	- 1.8	- 4.9	- 0.7	+ 1.3	+ 4.7	+ 8.1	+ 7.6	- 2.6	+ 5.0	+ 1.3	+ 2.1	+ 3.5	+ 4.1	+ 3.3
29th	+ 6.4	+ 1.9	+ 7.1	-	+ 3.3	+ 3.6	+ 4.7	+ 3.6	+ 0.5	- 1.5	- 3.5	- 4.5	- 3.2	- 2.1	+ 1.5	+ 0.9	+ 4.2	+ 5.4	+ 5.2	+ 4.3	+ 4.6	+ 4.8	+ 3.9	+ 3.3
30th	+ 2.4	+ 3.1	+ 3.5	+ 3.7	+ 3.6	+ 5.2	+ 5.4	+ 3.5	+ 1.3	+ 0.5	- 0.6	- 2.3	- 3.7	- 1.9	+ 3.3	+ 5.2	+ 5.9	+ 5.4	+ 4.3	+ 5.2	+ 6.5	+ 7.2	+ 5.7	+ 5.4
31st	+ 5.3	+ 3.0	+ 2.9	+ 4.1	+ 6.1	+ 5.3	+ 6.1	+ 0.1	- 0.9	- 2.4	+ 0.1	- 4.7	- 5.1	- 2.5	- 0.4	0.0	+ 1.5	+ 3.6	+ 2.2	+ 2.2	+ 3.3	+ 3.3	+ 3.0	+ 2.3
Means	+ 2.07	+ 2.34	+ 2.18	+ 2.53	+ 2.62	+ 3.27	+ 2.50	+ 0.91	- 1.89	- 5.06	- 5.88	- 5.83	- 3.40	- 0.06	+ 3.22	+ 5.03	+ 4.73	+ 4.37	+ 4.92	+ 3.87	+ 4.47	+ 4.11	+ 3.31	+ 1.75
Normals	+ 3.80	+ 4.06	+ 4.18	+ 4.53	+ 3.28	+ 4.06	+ 3.92	+ 2.59	- 0.36	- 2.61	- 4.46	- 4.12	- 2.36	+ 0.24	+ 3.53	+ 6.16	+ 5.36	+ 4.69	+ 4.92	+ 3.90	+ 4.56	+ 5.08	+ 4.81	+ 3.33

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JANUARY 1860.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 5.7	+ 4.6	+ 4.9	+ 5.6	+ 6.3	+ 6.8	+ 7.3	+ 5.3	+ 7.7	+ 7.6	+ 8.1	+ 5.6	+ 4.0	+ 6.8	+ 8.6	+ 10.0	+ 10.1	+ 8.6	+ 9.3	+ 7.5	+ 7.5	+ 9.0	+ 7.1	+ 4.6
2d	+ 6.7	+ 8.1	+ 6.4	+ 7.4	+ 4.1	+ 5.8	+ 4.8	+ 6.8	+ 10.1	+ 4.3	+ 3.0	+ 1.3	+ 0.7	+ 0.5	+ 2.7	+ 0.5	+ 1.2	+ 3.6	+ 4.5	+ 3.0	+ 4.7	+ 5.1	+ 5.0	+ 5.3
3d	+ 3.0	+ 4.3	+ 5.8	+ 4.7	+ 5.1	+ 2.4	+ 2.7	+ 2.0	+ 2.0	+ 0.3	0.0	+ 0.6	+ 1.5	+ 0.8	+ 1.5	+ 1.6	+ 3.9	+ 5.4	+ 7.5	+ 8.1	+ 4.6	+ 5.4	+ 6.4	+ 5.4
4th	+ 4.7	+ 3.5	+ 4.3	+ 6.3	+ 5.2	+ 4.1	+ 4.2	+ 3.1	+ 2.7	+ 0.8	+ 1.0	+ 1.6	+ 4.5	+ 4.6	+ 3.4	+ 6.9	+ 5.4	+ 6.6	+ 6.8	+ 4.8	+ 5.8	+ 6.2	+ 3.2	+ 4.6
5th	+ 3.3	+ 5.5	+ 3.8	+ 5.6	+ 3.4	+ 4.5	+ 3.6	+ 3.9	+ 2.7	+ 0.7	+ 0.2	+ 0.4	+ 2.1	+ 1.6	+ 1.4	+ 3.1	+ 0.6	+ 2.1	+ 3.5	+ 5.3	+ 5.2	+ 3.1	+ 5.2	+ 4.0
6th	+ 0.5	+ 1.8	+ 2.5	+ 1.9	+ 3.1	+ 3.4	+ 2.9	+ 0.3	+ 1.3	+ 3.7	+ 4.2	+ 2.2	+ 0.6	+ 1.1	+ 1.4	+ 0.4	+ 4.7	+ 4.7	+ 5.6	+ 6.1	+ 3.4	+ 4.4	+ 5.3	+ 1.8
7th	+ 3.2	+ 3.7	+ 10.2	+ 3.3	+ 2.5	+ 4.9	+ 4.6	+ 2.5	+ 1.1	+ 5.4	+ 7.8	+ 7.3	+ 4.8	+ 3.4	+ 3.0	+ 0.3	+ 3.3	+ 3.2	+ 3.6	+ 1.2	+ 1.8	+ 2.1	+ 5.9	+ 1.1
8th	+ 0.7	+ 0.3	+ 0.9	+ 0.6	+ 1.6	+ 1.9	+ 0.9	+ 1.2	+ 3.9	+ 7.7	+ 9.2	+ 8.3	+ 5.5	+ 0.7	+ 4.1	+ 4.7	+ 6.5	+ 5.8	+ 3.1	+ 1.1	+ 3.1	+ 3.7	+ 3.4	+ 2.6
9th	+ 1.9	+ 1.9	+ 2.2	+ 2.0	+ 2.4	+ 3.5	+ 5.3	+ 4.7	+ 2.3	+ 1.3	+ 2.0	+ 3.6	+ 1.7	+ 1.8	+ 0.7	+ 5.4	+ 5.7	+ 5.5	+ 4.3	+ 3.5	+ 5.0	+ 4.3	+ 4.1	+ 3.2
10th	+ 3.9	+ 2.9	+ 2.5	+ 3.0	+ 3.8	+ 4.3	+ 6.1	+ 6.0	+ 3.4	+ 2.5	+ 4.8	+ 3.4	+ 1.1	+ 4.9	+ 5.9	+ 6.7	+ 5.5	+ 6.1	+ 4.1	+ 2.3	+ 4.1	+ 4.2	+ 4.9	+ 4.7
11th	+ 4.0	+ 3.7	+ 4.3	+ 4.7	+ 4.8	+ 5.5	+ 6.1	+ 5.3	+ 4.8	+ 2.4	+ 0.6	+ 1.0	+ 4.1	+ 3.3	+ 7.2	+ 17.3	+ 4.4	+ 10.7	+ 9.0	+ 10.1	+ 11.2	+ 9.3	+ 7.9	+ 5.5
12th	+ 11.0	+ 1.9	+ 3.3	+ 3.5	+ 4.7	+ 0.3	+ 4.0	+ 0.7	+ 2.6	+ 6.1	+ 12.1	+ 19.8	+ 9.7	+ 9.2	+ 5.2	+ 4.2	+ 2.0	+ 3.4	+ 1.6	+ 0.7	+ 0.4	+ 0.8	+ 0.8	+ 0.0
13th	+ 1.2	+ 0.5	+ 0.2	+ 0.6	+ 0.5	+ 1.5	+ 2.0	+ 1.5	+ 0.2	+ 2.9	+ 6.0	+ 7.4	+ 7.9	+ 5.7	+ 2.1	+ 1.0	+ 4.5	+ 4.6	+ 4.3	+ 2.7	+ 2.9	+ 2.8	+ 2.8	+ 2.8
14th	+ 2.3	+ 2.5	+ 2.5	+ 3.0	+ 3.3	+ 3.5	+ 3.5	+ 5.1	+ 4.7	+ 0.8	+ 2.7	+ 5.3	+ 5.7	+ 3.6		+ 4.9	+ 4.9	+ 4.2	+ 4.6	+ 4.4	+ 5.4	+ 5.3	+ 5.8	+ 4.7
15th	+ 5.7	+ 4.1	+ 3.8	+ 5.1	+ 4.6	+ 4.9	+ 5.1	+ 4.0	+ 4.8	+ 0.2	+ 1.9	+ 4.1	+ 3.5	+ 2.0	+ 0.7	+ 4.4	+ 6.9	+ 7.1	+ 6.6	+ 5.2	+ 5.9	+ 5.9	+ 5.9	+ 5.0
16th	+ 5.4	+ 5.1	+ 5.0	+ 5.9	+ 6.5	+ 5.7	+ 8.5	+ 2.2	+ 10.1	+ 7.4			+ 0.3	+ 2.3	+ 1.7	+ 5.3	+ 5.9	+ 6.3	+ 0.8	+ 2.7	+ 3.7	+ 4.1	+ 4.2	+ 0.3
17th	+ 1.1	+ 5.6	+ 3.5	+ 2.2	+ 1.3	+ 0.1	+ 2.6	+ 1.6	+ 1.2	+ 2.8	+ 0.3	+ 5.0	+ 5.1	+ 0.1	+ 2.4	+ 5.9	+ 4.6	+ 4.9	+ 4.1	+ 3.8	+ 3.4	+ 4.1	+ 3.0	+ 1.9
18th	+ 2.2	+ 2.1	+ 3.2	+ 1.7	+ 2.0	+ 1.9	+ 2.4	+ 2.6	+ 1.3	+ 3.3	+ 4.5	+ 6.8	+ 2.7	+ 0.8	+ 1.3	+ 4.9	+ 4.0	+ 3.1	+ 2.6	+ 4.7	+ 5.5	+ 4.6	+ 3.8	+ 4.5
19th	+ 4.4	+ 3.6	+ 3.8	+ 3.4	+ 3.3	+ 4.0	+ 4.3	+ 4.6	+ 1.5	+ 0.9	+ 4.9	+ 0.8	+ 0.2	+ 3.5	+ 8.1	+ 9.7	+ 9.3	+ 10.1	+ 8.3	+ 1.9	+ 1.4	+ 3.3	+ 2.8	+ 2.0
20th	+ 1.9	+ 2.0	+ 1.5	+ 1.1	+ 0.5	+ 0.4	+ 0.1	+ 3.8	+ 4.8	+ 6.2	+ 2.3	+ 1.1	+ 0.2	+ 3.7	+ 4.1	+ 2.1	+ 2.0	+ 2.6	+ 0.7	+ 4.0	+ 3.0	+ 3.5	+ 2.8	+ 3.4
21st	+ 3.8	+ 0.9	+ 3.0	0.0	+ 0.6	+ 3.5	0.0	+ 0.3	+ 3.6	+ 9.1		+ 10.7	+ 6.7	+ 1.3	+ 2.8	+ 6.6	+ 5.4	+ 3.3	+ 1.9	+ 0.7	+ 3.4	+ 3.2	+ 4.4	+ 3.5
22d	+ 3.2	+ 14.1	+ 5.3	+ 1.5	+ 8.0	+ 5.4	+ 2.4	+ 5.1	+ 1.1	+ 3.9	+ 0.9	+ 9.8	+ 5.2	+ 7.1	+ 0.7	+ 4.5	+ 6.3	+ 4.5	+ 0.5	+ 4.3	+ 1.5	+ 2.8	+ 2.2	+ 10.1
23d	+ 4.3	+ 2.2	+ 4.6	+ 7.2	+ 5.2	+ 2.6	+ 3.8	+ 2.3	+ 1.3	+ 7.0	+ 4.5	+ 8.8	+ 8.7	+ 1.4	+ 0.8	+ 2.7	+ 4.9	+ 7.2	+ 7.3	+ 6.5	+ 7.3	+ 5.8	+ 5.7	+ 6.9
24th	+ 5.7	+ 5.2	+ 5.5	+ 6.2	+ 5.6	+ 6.2	+ 7.1	+ 4.8	+ 0.8	+ 6.7	+ 9.0	+ 7.6	+ 5.0	+ 0.3	+ 5.1	+ 7.5	+ 7.8	+ 6.9	+ 6.0	+ 4.1	+ 4.7	+ 4.8	+ 6.1	+ 5.7
25th	+ 5.3	+ 4.8	+ 6.4	+ 7.1	+ 4.6	+ 5.7	+ 6.5	+ 4.8	+ 1.8	+ 1.8	+ 6.3	+ 7.6	+ 9.2	+ 4.5	+ 2.1	+ 5.8	+ 8.0	+ 6.7	+ 6.5	+ 5.7	+ 6.4	+ 4.8	+ 6.3	+ 3.4
26th	+ 1.7	+ 1.7	+ 2.8	+ 2.3	+ 3.4	+ 2.3	+ 9.0	+ 4.6	+ 1.4	+ 4.4	+ 5.0	+ 6.5	+ 2.0	+ 2.2	+ 5.8	+ 6.4	+ 8.2	+ 6.5	+ 3.8	+ 3.3	+ 4.7	+ 6.1	+ 6.0	+ 5.6
27th	+ 4.4	+ 4.4	+ 4.8	+ 3.7	+ 4.6	+ 4.2	+ 5.6	+ 1.5	+ 1.9	+ 6.2	+ 0.7	+ 4.7	+ 5.8	+ 6.5	+ 1.3	+ 1.8	+ 2.9	+ 6.4	+ 1.5	+ 0.1	+ 8.5	+ 10.1	+ 7.4	+ 9.2
28th	+ 9.5	+ 11.5	+ 9.6	+ 6.5	+ 6.4	+ 10.7	+ 12.3	+ 7.7	+ 4.0	+ 1.9		+ 6.9	+ 3.8	+ 0.9	+ 6.9	+ 6.3	+ 11.8	+ 3.6	+ 4.2	+ 2.3	+ 9.4	+ 18.0	+ 7.9	+ 7.6
29th	+ 0.9	+ 1.1	+ 2.3	+ 1.7	+ 1.8	+ 2.1	+ 1.6	+ 1.8	+ 3.8	+ 6.8	+ 9.8	+ 11.2	+ 7.8	+ 3.2	+ 2.8	+ 2.6	+ 1.2	+ 0.8	+ 1.4	+ 3.7	+ 0.1	+ 0.7	+ 1.8	+ 2.7
30th	+ 3.7	+ 1.5	+ 0.9	+ 0.9	+ 3.3	+ 2.0	+ 1.8	+ 1.3	+ 0.3	+ 4.4	+ 1.1	+ 7.1	+ 2.8	+ 1.0	+ 0.6	+ 2.2	+ 4.2	+ 2.0	+ 3.3	+ 2.7	+ 1.6	+ 3.9	+ 5.9	+ 3.9
31st	+ 4.9	+ 2.2	+ 0.1	+ 1.6	+ 1.7	+ 1.6	+ 1.4	+ 1.7	+ 0.6	+ 2.4	+ 3.4	+ 2.0	+ 0.0	+ 3.4	+ 6.9	+ 7.9	+ 7.5	+ 6.1	+ 6.1	+ 4.9	+ 5.0	+ 4.9		+ 4.7
Means	+ 3.82	+ 3.62	+ 3.66	+ 3.45	+ 3.57	+ 3.58	+ 4.00	+ 2.76	+ 1.34	+ 1.95	+ 2.70	+ 4.98	+ 2.85	+ 0.50	+ 1.78	+ 4.68	+ 5.15	+ 5.03	+ 4.33	+ 3.86	+ 4.50	+ 5.04	+ 4.80	+ 3.73
Normals	+ 3.82	+ 2.98	+ 3.66	+ 3.45	+ 3.57	+ 3.58	+ 3.72	+ 2.76	+ 0.73	+ 2.92	+ 2.76	+ 4.83	+ 2.85	+ 0.21	+ 1.78	+ 4.56	+ 5.15	+ 5.34	+ 4.33	+ 3.86	+ 4.50	+ 4.61	+ 4.80	+ 4.10

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF FEBRUARY 1860.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.4	+ 3.7	+ 3.2	+ 8.3	+ 2.4	+ 4.2	+ 3.0	+ 2.3	+ 0.2	- 0.3	- 1.1	- 1.6	- 2.1	- 2.0	+ 2.6	+ 5.9	+ 4.7	+ 5.5	+ 6.2	+ 5.7	+ 4.7	+ 6.4	+ 5.9	+ 4.9
2d	+ 4.4	+ 5.0	+ 3.8	+ 4.9	+ 4.8	+ 4.1	+ 4.4	+ 2.0	- 1.2	- 3.0	- 1.3	-	- 2.4	+ 0.4	+ 1.9	+ 4.4	+ 4.8	+ 5.6	+ 6.6	+ 5.7	+ 3.8	+ 5.8	+ 5.6	+ 5.1
3d	+ 4.6	+ 4.8	+ 5.0	+ 4.1	+ 4.2	+ 3.8	+ 2.3	+ 4.0	+ 1.7	- 2.3	- 3.7	- 5.2	- 3.8	+ 0.7	+ 1.2	+ 4.3	+ 5.4	+ 4.9	+ 3.2	+ 4.9	+ 5.6	+ 6.1	+ 3.7	+ 4.6
4th	+ 2.5	+ 4.5	+ 4.2	+ 3.1	+ 3.6	+ 3.5	+ 4.6	+ 2.3	- 0.6	- 3.5	- 6.9	- 8.1	- 6.6	- 5.4	- 2.0	+ 2.2	+ 5.7	+ 4.0	+ 5.2	+ 4.7	+ 5.8	+ 6.0	+ 4.7	+ 4.7
5th	+ 4.0	+ 2.7	+ 3.9	+ 5.3	+ 4.8	+ 5.1	+ 5.6	+ 4.2	+ 1.1	- 2.5	- 2.4	- 6.2	- 3.3	- 0.6	+ 2.6	+ 1.6	+ 3.8	+ 4.3	+ 6.2	+ 7.3	+ 6.5	+ 5.6	+ 4.9	+ 5.4
6th	+ 4.6	+ 4.6	+ 6.0	+ 4.5	+ 4.5	+ 5.0	+ 3.6	+ 0.9	- 1.5	- 3.4	- 1.4	- 2.4	- 2.4	- 1.3	- 0.2	+ 3.5	+ 8.0	+ 9.4	+ 9.4	+ 6.8	+ 7.7	+ 7.5	+ 7.8	+ 7.0
7th	+ 6.0	+ 6.6	+ 5.5	+ 5.8	+ 6.4	+ 6.9	+ 7.5	+ 7.0	+ 3.8	- 0.9	+ 0.9	- 3.9	- 2.3	+ 1.8	+ 4.4	+ 7.2	+ 10.6	+ 10.8	+ 7.8	+ 6.0	+ 6.2	+ 7.5	+ 7.3	+ 6.8
8th	+ 7.0	+ 6.6	+ 6.3	+ 7.2	+ 6.6	+ 7.4	+ 7.2	+ 6.3	+ 3.3	- 0.1	+ 0.2	- 3.8	- 1.5	+ 0.7	+ 1.9	+ 6.2	+ 8.2	+ 6.8	+ 5.3	+ 7.0	+ 7.7	+ 8.1	+ 8.0	+ 6.5
9th	+ 6.2	+ 5.5	+ 5.7	+ 6.3	+ 6.2	+ 6.1	+ 6.2	+ 4.6	+ 2.3	- 1.2	- 3.5	- 5.7	- 4.3	- 0.4	+ 4.3	+ 4.7	+ 9.2	+ 9.0	+ 9.7	+ 9.7	+ 11.1	+ 9.4	+ 9.9	+ 9.6
10th	+ 9.5	+ 12.7	+ 6.6	+ 5.9	+ 4.7	+ 5.5	+ 6.2	+ 4.2	- 0.1	- 1.8	- 3.8	- 6.0	- 5.0	- 2.7	+ 0.5	+ 4.8	+ 3.9	+ 8.4	+ 8.1	+ 6.6	+ 7.6	+ 7.9	+ 5.3	+ 6.9
11th	+ 6.6	+ 5.9	+ 6.4	+ 6.0	+ 5.3	+ 4.1	- 3.8	+ 5.1	0.0	- 3.8	- 7.5	- 9.3	- 8.3	+ 4.2	- 0.9	+ 3.6	+ 5.9	+ 6.7	+ 4.2	+ 4.1	+ 3.2	+ 4.4	+ 3.9	+ 4.8
12th	+ 2.7	+ 4.4	+ 4.9	+ 4.8	+ 4.8	+ 6.2	+ 7.6	+ 6.7	+ 5.5	+ 2.9	- 0.1	- 3.1	- 2.9	- 0.5	+ 4.6	+ 7.9	+ 9.8	+ 10.3	+ 8.1	+ 3.3	+ 1.8	+ 3.5	+ 4.1	+ 4.2
13th	+ 1.4	- 1.4	- 0.6	+ 1.5	+ 1.8	+ 1.9	+ 1.3	+ 3.4	+ 2.3	- 4.1	- 9.6	- 13.4	- 13.9	- 9.3	- 4.4	+ 0.6	+ 1.2	+ 4.8	+ 2.9	+ 2.9	+ 1.8	+ 1.9	+ 0.1	+ 0.4
14th	- 1.1	- 0.3	+ 1.5	+ 1.4	+ 2.1	+ 2.3	+ 2.5	+ 1.2	- 1.6	- 3.4	- 6.3	- 7.9	- 5.5	- 3.9	- 0.7	+ 3.0	+ 4.7	+ 4.9	+ 4.5	+ 3.6	+ 3.9	+ 2.8	+ 3.8	+ 4.3
15th	+ 4.1	+ 3.9	+ 3.7	+ 4.0	+ 4.1	+ 4.2	+ 3.2	+ 1.6	+ 0.5	+ 0.4	+ 1.8	- 0.6	+ 0.7	+ 2.5	+ 6.7	+ 7.8	-	+ 1.6	+ 2.5	+ 3.7	+ 3.4	+ 3.7	+ 3.7	+ 4.4
16th	+ 6.2	+ 4.6	+ 2.0	+ 4.5	+ 3.1	+ 2.3	+ 0.8	- 1.7	- 2.6	- 4.7	- 6.5	- 7.6	- 3.7	+ 1.1	+ 1.5	+ 0.6	+ 5.3	+ 6.3	+ 3.9	+ 7.7	+ 5.5	+ 6.2	+ 6.2	+ 6.0
17th	+ 7.6	+ 5.4	+ 6.8	+ 7.5	+ 7.2	+ 7.4	+ 7.2	+ 5.5	+ 5.0	+ 2.9	+ 4.4	+ 4.3	+ 2.7	+ 4.1	+ 3.8	+ 7.6	+ 7.1	+ 6.3	+ 6.2	+ 5.7	+ 2.2	+ 1.9	- 1.7	- 10.6
18th	- 1.4	- 2.8	+ 6.7	+ 1.9	- 1.9	- 0.2	- 0.8	- 3.9	- 6.8	- 11.9	- 14.9	- 13.9	- 7.6	- 5.6	- 4.4	- 1.8	+ 0.2	+ 0.2	+ 3.7	+ 2.7	+ 6.0	+ 6.1	+ 6.3	+ 6.3
19th	+ 6.4	+ 9.6	+ 5.9	+ 3.3	+ 4.3	+ 5.0	+ 5.1	+ 3.2	+ 1.1	- 4.8	- 5.4	- 6.7	- 4.7	- 12.0	- 5.8	0.0	+ 2.6	- 0.1	+ 2.5	+ 0.8	+ 3.2	+ 4.3	+ 8.6	+ 4.0
20th	+ 0.3	- 2.1	- 0.8	+ 0.9	+ 1.0	+ 3.2	+ 4.0	+ 2.6	- 2.1	- 5.4	- 9.2	- 7.7	- 4.4	- 2.9	- 2.1	- 0.3	+ 2.8	+ 1.9	+ 3.1	+ 2.5	+ 2.3	- 5.0	+ 0.9	+ 3.0
21st	+ 3.9	+ 3.0	+ 2.4	+ 3.8	+ 4.6	+ 3.9	+ 6.0	+ 4.4	+ 2.4	- 2.6	- 7.6	- 4.8	+ 0.1	+ 2.8	+ 1.5	+ 1.1	+ 1.4	0.0	+ 0.2	+ 2.4	+ 5.8	- 2.6	+ 5.3	- 7.7
22d	- 1.2	- 0.5	+ 4.7	- 4.6	- 6.2	- 0.5	- 0.3	- 0.6	- 13.8	- 23.2	- 13.8	- 19.2	- 17.0	- 15.3	- 17.7	- 4.9	- 8.8	- 8.4	- 8.1	- 3.2	- 9.2	- 5.8	- 0.5	- 2.3
23d	- 3.9	- 2.0	- 4.2	+ 1.1	- 5.6	+ 2.6	- 0.7	- 6.8	- 4.5	- 9.4	- 13.1	- 12.8	- 10.9	- 8.0	- 6.4	- 2.8	- 1.9	- 3.7	- 1.3	+ 0.5	+ 0.3	+ 0.9	+ 1.2	- 0.2
24th	- 0.1	+ 0.5	+ 0.4	- 0.2	+ 0.5	+ 0.9	+ 0.9	- 0.7	- 1.8	- 2.7	- 5.6	- 7.9	- 5.5	- 3.5	- 0.3	+ 0.2	+ 1.8	- 1.9	+ 1.0	+ 0.8	+ 1.1	+ 1.7	+ 0.8	+ 1.6
25th	+ 0.7	+ 1.2	+ 2.0	+ 0.8	+ 2.6	+ 1.6	- 1.4	+ 1.7	+ 2.5	+ 1.4	- 1.4	- 4.4	- 5.6	- 4.4	- 1.9	+ 0.5	+ 0.9	+ 1.8	+ 3.7	+ 4.5	+ 5.6	+ 6.4	+ 7.7	+ 3.7
26th	+ 3.6	+ 2.9	+ 4.3	+ 4.0	+ 4.3	+ 4.1	+ 5.3	+ 3.7	+ 1.4	+ 4.5	- 1.4	- 4.0	- 2.5	- 0.7	+ 1.5	- 0.5	+ 3.0	+ 8.0	+ 6.8	+ 6.8	+ 7.5	+ 8.5	+ 6.6	+ 6.0
27th	+ 5.8	+ 6.0	+ 5.5	+ 5.5	+ 7.7	+ 7.4	+ 7.7	+ 7.9	+ 4.5	+ 4.5	+ 2.3	+ 1.7	- 0.1	+ 2.4	+ 4.1	+ 7.8	+ 10.6	+ 7.1	+ 8.8	+ 8.9	+ 9.8	+ 9.3	+ 10.0	+ 9.2
28th	+ 8.9	+ 7.4	+ 13.2	+ 6.5	+ 7.5	+ 7.9	+ 8.5	+ 8.7	+ 6.3	+ 3.1	+ 0.3	- 2.5	0.0	- 1.4	+ 2.4	+ 4.6	+ 7.0	+ 7.3	+ 8.4	+ 9.9	+ 5.9	+ 6.9	+ 1.4	+ 5.9
29th	+ 6.3	+ 7.3	+ 6.2	+ 6.6	+ 6.7	+ 6.5	+ 7.4	+ 6.9	+ 7.4	+ 4.8	- 0.1	- 3.5	- 3.3	- 1.5	+ 1.1	+ 7.2	+ 6.4	+ 7.9	+ 5.8	+ 4.1	+ 6.4	+ 5.4	+ 6.3	+ 6.9
Means	+ 3.76	+ 3.78	+ 4.18	+ 3.72	+ 3.52	+ 4.22	+ 3.74	+ 2.99	+ 0.51	- 2.43	- 4.02	- 5.94	- 4.34	- 2.09	+ 0.04	+ 3.09	+ 4.44	+ 4.36	+ 4.64	+ 4.69	+ 4.59	+ 4.51	+ 4.75	+ 3.84
Normals	+ 3.76	+ 3.46	+ 4.16	+ 4.02	+ 4.22	+ 4.22	+ 3.74	+ 3.34	+ 1.02	- 1.00	- 3.17	- 5.50	- 3.52	- 0.93	+ 0.67	+ 3.00	+ 4.93	+ 5.13	+ 5.10	+ 4.69	+ 5.09	+ 5.24	+ 4.75	+ 4.80

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MARCH 1860.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 7.0	+ 5.6	+ 6.7	+ 7.9	+ 7.8	+ 6.8	+ 5.6	+ 5.0	+ 2.6	+ 1.3	- 1.8	- 4.7	- 4.5	- 0.4	+ 2.6	+ 5.8	+ 6.1	+ 4.7	+ 3.1	+ 4.8	+ 5.8	+ 6.6	+ 6.0	+ 6.1
2d	+ 6.0	+ 5.8	+ 6.1	+ 6.2	+ 6.5	+ 6.8	+ 6.4	+ 5.0	+ 2.0	- 3.5	- 5.7	- 5.1	- 2.6	- 0.6	+ 1.9	+ 4.7	+ 5.3	+ 5.3	+ 3.6	+ 5.3	+ 5.9	+ 5.2	+ 5.5	+ 6.2
3d	+ 4.4	+ 3.7	+ 2.2	+ 1.5	+ 3.4	+ 4.6	+ 5.0	+ 4.0	+ 3.8	+ 0.9	- 1.7	- 2.2	- 1.2	+ 3.6	+ 4.9	+ 6.5	+ 3.8	+ 2.6	+ 7.1	+ 5.0	+ 6.9	+ 6.4	+ 7.0	+ 3.8
4th	+ 5.8	+ 4.7	+ 5.1	+ 5.4	+ 5.1	+ 5.9	+ 6.2	+ 5.2	+ 1.3	- 1.1	- 3.2	- 5.3	- 6.9	- 4.9	- 0.2	+ 2.1	+ 5.1	+ 5.3	+ 5.8	+ 8.7	+ 6.5	+ 8.0	+ 6.6	+ 7.4
5th	+ 7.0	+ 6.5	+ 7.5	+ 7.3	+ 8.5	+ 6.5	+ 5.1	+ 5.5	+ 1.9	- 3.3	- 6.7	- 6.7	- 6.4	- 4.1	- 2.0	+ 0.9	+ 2.8	+ 1.7	+ 2.0	- 1.3	- 2.4	+ 3.0	- 4.6	+ 3.7
6th	+ 4.9	+ 4.9	+ 4.9	+ 5.0	+ 4.5	+ 4.0	+ 3.8	+ 1.5	- 1.7	- 3.0	- 5.8	- 7.5	- 7.0	- 1.8	0.0	+ 2.8	+ 0.6	+ 3.5	+ 4.7	+ 5.7	+ 4.8	+ 6.0	+ 4.7	+ 3.6
7th	+ 3.7	+ 4.9	+ 4.5	+ 5.1	+ 5.3	+ 4.5	+ 4.6	+ 3.5	- 0.9	- 3.8	- 5.3	- 5.4	- 3.8	- 2.1	+ 3.4	+ 5.6	+ 4.3	+ 5.1	+ 6.0	+ 5.4	+ 5.9	+ 5.9	+ 4.9	+ 4.6
8th	+ 4.4	+ 5.2	+ 5.2	+ 4.4	+ 5.4	+ 7.3	+ 8.0	+ 7.1	+ 4.5	+ 0.4	- 1.9	- 1.5	+ 1.4	+ 4.7	+ 5.2	+ 14.9	+ 11.1	+ 8.7	+ 1.5	+ 9.0	+ 6.9	+ 3.9	- 1.6	- 4.4
9th	- 1.9	+ 0.9	- 1.7	- 1.0	+ 1.8	+ 0.9	- 0.3	- 1.7	- 4.3	- 6.7	- 7.6	- 8.4	- 5.1	- 2.8	+ 1.8	+ 3.6	+ 4.7	+ 2.9	+ 0.2	+ 1.1	+ 2.1	+ 2.8	+ 3.2	+ 2.2
10th	+ 3.0	+ 2.4	+ 4.1	+ 3.6	+ 2.7	+ 2.8	+ 2.9	+ 0.6	- 3.2	- 6.7	- 11.1	- 6.4	- 5.9	- 3.1	+ 0.8	+ 0.6	+ 1.1	- 7.2	+ 2.5	+ 5.7	+ 2.9	+ 5.2	+ 3.2	+ 3.6
11th	+ 3.8	+ 3.5	+ 4.0	+ 3.4	+ 4.2	+ 4.4	+ 4.0	+ 0.6	- 2.2	- 2.5	- 4.7	- 5.4	- 4.6	- 1.9	+ 0.8	+ 3.5	+ 3.4	+ 3.0	+ 2.8	+ 4.8	+ 5.8	+ 6.0	+ 5.7	+ 4.8
12th	+ 10.9	+ 5.8	+ 4.9	+ 4.3	+ 4.9	+ 4.8	+ 4.7	+ 2.7	+ 0.3	- 1.9	- 3.9	- 4.0	- 1.3	+ 2.1	+ 6.2	+ 7.9	+ 8.9	+ 7.9	+ 7.0	+ 7.1	+ 2.8	+ 6.9	+ 10.4	+ 8.1
13th	+ 2.5	- 7.0	- 4.3	- 0.9	- 2.7	+ 3.0	+ 2.7	- 4.3	+ 3.0	- 6.0	- 9.4	- 14.6	- 9.4	- 4.0	- 0.4	- 1.3	- 4.6	- 0.9	+ 3.1	+ 1.7	+ 3.4	+ 4.7	+ 4.8	+ 6.0
14th	+ 4.5	+ 0.7	+ 1.3	+ 9.1	+ 4.9	+ 4.5	+ 3.6	- 0.6	+ 0.2	- 1.6	- 4.3	- 5.7	- 8.9	- 8.0	-	- 11.4	- 2.1	- 1.0	+ 0.9	+ 4.8	+ 4.4	+ 5.6	+ 6.7	+ 4.9
15th	+ 1.7	- 1.1	+ 0.1	+ 2.9	+ 0.3	+ 2.5	+ 0.9	+ 0.2	- 2.2	- 6.1	- 8.5	- 8.0	- 9.1	- 6.0	- 3.0	- 1.0	- 0.1	+ 1.9	+ 2.8	+ 4.9	+ 2.6	+ 13.2	+ 4.1	+ 5.6
16th	+ 6.3	+ 5.3	+ 6.2	+ 6.9	+ 6.4	+ 9.3	+ 9.2	+ 6.9	+ 2.7	- 0.3	- 1.6	- 3.2	- 2.4	- 0.9	- 1.8	- 0.6	0.0	+ 3.2	+ 2.7	+ 4.2	+ 5.6	+ 11.3	+ 4.8	+ 4.8
17th	+ 5.2	+ 7.5	+ 8.1	+ 7.8	+ 5.5	+ 7.2	+ 6.1	+ 5.2	+ 3.7	- 3.9	- 3.1	- 0.9	+ 0.4	+ 0.8	+ 1.0	+ 0.5	+ 1.9	+ 3.4	+ 2.5	+ 10.9	+ 6.0	+ 1.9	+ 7.9	+ 5.4
18th	+ 3.3	- 2.0	+ 2.2	+ 3.0	+ 10.2	+ 9.9	+ 4.8	+ 0.1	+ 1.0	- 3.6	- 10.2	- 9.7	- 13.9	- 12.8	- 8.8	- 8.2	- 8.4	- 1.2	- 0.1	- 5.2	- 6.4	- 3.5	- 2.4	- 2.9
19th	- 2.4	- 3.3	- 3.2	+ 0.9	+ 5.8	+ 1.5	+ 5.6	+ 1.1	- 0.9	- 0.6	- 2.4	- 4.6	- 4.6	- 5.0	- 5.0	- 1.8	- 6.0	- 6.9	- 6.2	- 5.2	- 9.4	- 11.1	- 2.8	- 5.0
20th	- 2.8	- 0.5	+ 0.5	+ 4.3	+ 7.2	+ 1.6	+ 1.5	+ 2.9	+ 0.2	- 0.6	- 4.3	- 5.8	- 1.6	+ 1.1	- 0.6	+ 3.8	+ 3.0	+ 1.5	+ 5.1	+ 6.9	+ 5.2	+ 5.5	+ 5.3	+ 5.3
21st	+ 6.0	+ 5.7	+ 5.3	+ 6.5	+ 9.4	+ 5.3	+ 5.0	+ 3.4	- 1.6	+ 0.4	- 3.9	- 8.9	- 6.7	- 3.8	- 2.2	- 2.4	- 0.6	+ 1.4	+ 2.8	+ 5.8	+ 3.0	+ 0.1	+ 5.9	+ 5.1
22d	+ 1.5	+ 3.9	+ 2.9	+ 3.9	+ 3.9	+ 5.0	+ 6.2	+ 5.8	+ 5.4	+ 2.8	+ 1.5	- 1.9	- 3.0	- 2.1	+ 0.8	+ 0.8	+ 1.2	+ 2.8	+ 3.3	+ 6.7	+ 7.5	+ 6.7	+ 5.9	+ 12.1
23d	+ 8.1	+ 5.4	+ 11.0	+ 11.3	+ 6.5	+ 6.7	+ 6.9	+ 2.7	+ 1.7	+ 0.4	- 0.7	- 1.0	0.0	- 1.2	+ 0.5	+ 2.5	+ 4.5	-	+ 6.7	+ 6.1	+ 7.7	+ 6.6	+ 8.2	+ 12.6
24th	+ 7.7	+ 6.7	+ 6.3	+ 6.9	+ 7.6	+ 10.6	+ 9.2	+ 11.0	+ 8.6	+ 5.3	+ 0.2	- 1.9	- 3.2	- 2.1	- 0.7	+ 2.1	+ 6.5	+ 7.4	+ 7.6	+ 9.5	+ 9.4	+ 8.5	+ 8.3	+ 8.0
25th	+ 7.5	+ 7.6	+ 7.5	+ 8.3	+ 9.0	+ 8.2	+ 9.4	+ 8.3	+ 6.7	+ 4.3	+ 0.2	+ 4.7	- 1.6	+ 2.2	+ 5.0	+ 5.1	+ 4.5	+ 6.2	+ 7.6	+ 8.3	+ 9.3	+ 9.3	+ 9.3	+ 9.7
26th	+ 8.9	+ 8.4	+ 7.8	+ 8.5	+ 9.1	+ 9.2	+ 9.9	+ 9.6	+ 7.2	+ 4.0	+ 2.0	+ 0.6	0.0	+ 1.1	+ 3.6	+ 7.1	+ 8.7	+ 9.8	+ 9.4	+ 10.2	+ 11.1	+ 10.1	+ 9.6	+ 12.2
27th	+ 10.0	+ 10.1	+ 10.8	+ 11.0	+ 11.6	+ 13.2	+ 12.5	+ 11.0	+ 11.2	+ 6.7	+ 3.7	- 1.9	0.0	+ 3.5	+ 7.8	+ 11.4	+ 11.0	+ 2.7	- 1.0	+ 12.1	+ 8.1	+ 13.4	+ 9.7	+ 9.5
28th	+ 9.4	+ 7.7	+ 11.3	+ 9.9	+ 9.8	+ 9.8	+ 9.4	+ 8.4	+ 7.8	+ 5.3	+ 4.3	+ 3.1	+ 1.2	+ 0.8	+ 4.8	+ 10.8	+ 13.7	+ 4.2	+ 6.6	+ 9.9	- 25.1	- 32.3	- 27.1	- 18.3
29th	- 20.6	- 17.4	- 15.3	- 18.0	- 16.8	- 17.3	- 14.3	- 16.5	- 17.8	- 11.2	- 21.3	- 25.7	- 27.7	- 23.6	- 26.1	- 14.4	- 11.9	- 24.2	- 19.3	- 25.5	- 27.6	- 11.5	- 23.3	- 16.5
30th	- 32.1	- 23.3	- 3.6	- 18.7	- 6.7	- 13.9	- 4.2	- 11.5	- 14.0	- 19.2	- 20.0	- 19.5	- 19.2	- 19.7	- 14.4	- 8.0	- 5.4	- 3.7	- 4.5	- 5.4	- 2.4	+ 1.1	- 2.5	- 3.9
31st	- 2.4	- 0.4	+ 1.7	+ 1.7	+ 0.1	- 0.7	+ 0.2	+ 1.1	+ 3.3	- 1.4	- 5.3	- 5.2	- 9.7	- 9.2	- 4.1	- 0.9	- 0.3	- 0.9	+ 0.3	+ 2.9	+ 4.6	+ 5.5	+ 4.5	+ 5.2
Means	+ 2.62	+ 2.19	+ 3.55	+ 3.82	+ 4.55	+ 4.35	+ 4.54	+ 2.70	+ 0.98	- 1.46	- 4.60	- 5.57	- 5.40	- 3.23	- 0.61	+ 1.71	+ 2.35	+ 1.64	+ 2.47	+ 4.03	+ 2.29	+ 3.58	+ 2.84	+ 3.53
Normals	+ 4.40	+ 4.13	+ 4.47	+ 5.35	+ 5.98	+ 5.46	+ 5.24	+ 3.33	+ 1.82	- 0.77	- 4.04	- 4.64	- 3.80	- 1.58	- 0.90	+ 2.41	+ 2.53	+ 2.99	+ 3.81	+ 5.93	+ 4.93	+ 5.71	+ 5.10	+ 5.25

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF APRIL 1860.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 6.7	+ 5.9	+ 3.9	+ 4.8	+ 5.2	+ 5.1	+ 6.1	+ 6.9	+ 5.8	+ 3.8	- 0.3	- 3.5	- 3.1	- 5.9	- 3.1	- 1.6	+ 4.1	+ 1.2	+ 0.8	+ 2.9	+ 4.9	+ 5.1	+ 4.7	+ 5.1
2d	+ 6.1	+ 5.0	+ 5.7	+ 6.6	+ 7.5	+ 6.7	+ 7.0	+ 7.5	+ 6.7	+ 5.6	+ 4.9	+ 2.6	+ 3.8	+ 3.7	+ 6.7	+ 6.1	+ 7.3	+ 9.1	+ 10.0	+ 9.7	+ 10.4	+ 8.4	+ 10.2	+ 8.4
3d	+ 9.3	+ 9.1	+ 10.3	+ 11.5	+ 10.5	+ 10.4	+ 10.8	+ 9.1	+ 6.2	- 1.0	+ 5.3	+ 5.9	+ 6.1	+ 3.0	- 0.7	- 0.4	+ 3.2	+ 1.2	+ 2.1	+ 3.0	- 0.2	+ 1.0	- 1.9	- 2.4
4th	+ 0.5	+ 0.2	+ 3.9	+ 2.9	+ 2.6	+ 2.6	+ 2.0	+ 2.1	+ 1.1	+ 1.0	+ 2.8	+ 3.1	+ 3.6	+ 4.3	- 0.1	+ 0.8	+ 1.1	+ 3.6	+ 4.4	+ 4.6	+ 4.5	+ 2.2	+ 3.0	+ 1.7
5th	+ 1.3	+ 5.0	+ 2.9	+ 4.8	+ 4.0	-	+ 0.3	+ 2.6	+ 1.5	- 0.4	- 3.8	- 6.2	- 6.1	- 4.4	- 3.2	+ 0.5	- 0.3	+ 3.3	+ 3.5	+ 4.9	+ 6.5	+ 5.7	+ 6.5	+ 5.0
6th	+ 4.1	+ 3.8	+ 4.0	+ 6.4	+ 5.7	+ 5.4	+ 5.5	+ 4.3	+ 2.3	+ 0.6	- 0.8	- 2.7	- 3.3	- 1.0	+ 3.1	+ 6.1	+ 8.9	+ 9.0	+ 7.8	+ 5.3	+ 9.5	+ 10.1	+ 9.1	+ 8.4
7th	+ 9.2	+ 8.4	+ 8.0	+ 8.5	+ 9.3	+ 8.0	+ 7.9	+ 7.2	+ 6.6	+ 3.3	- 0.1	- 1.9	- 2.1	- 1.9	+ 1.3	+ 4.0	+ 5.7	+ 6.8	+ 7.2	+ 4.9	+ 4.6	+ 7.9	+ 8.5	+ 8.0
8th	+ 7.9	+ 7.7	+ 8.6	+ 7.4	+ 7.3	+ 7.9	+ 8.5	+ 7.7	+ 6.1	+ 4.8	+ 3.6	+ 9.0	+ 4.4	+ 6.1	+ 5.9	+ 8.2	+ 8.0	+ 7.6	+ 9.3	+ 9.1	+ 10.8	+ 4.8	+ 2.3	+ 6.5
9th	+ 8.1	+ 7.6	+ 8.5	+ 7.5	+ 8.5	+ 9.5	+ 9.0	+ 7.5	+ 5.1	+ 1.4	- 1.6	- 2.4	- 1.1	+ 1.2	+ 5.2	+ 9.0	+ 9.4	+ 7.7	+ 4.3	+ 2.4	+ 1.8	+ 0.7	+ 0.4	+ 0.4
10th	- 4.2	- 0.9	- 2.1	- 4.3	- 11.3	- 5.0	- 6.0	- 6.9	- 5.4	- 10.0	- 7.0	- 8.4	- 17.6	- 16.2	- 11.9	- 7.2	- 6.1	- 7.3	- 6.9	- 7.3	- 8.0	+ 7.5	- 4.6	+ 3.8
11th	- 0.1	- 1.4	+ 2.4	+ 1.5	+ 1.8	+ 0.2	- 1.0	+ 0.4	- 0.5	- 1.7	- 4.2	- 7.5	- 6.5	- 5.9	- 2.7	- 1.8	- 0.6	+ 1.0	+ 3.5	+ 2.2	+ 4.5	+ 2.9	+ 3.0	+ 2.9
12th	+ 7.8	+ 12.6	+ 6.8	+ 6.2	+ 3.9	+ 1.9	+ 6.7	+ 7.3	+ 2.4	+ 0.5	- 1.5	- 2.5	- 2.9	- 5.4	- 0.4	- 2.8	- 4.7	- 0.2	+ 0.3	+ 3.6	+ 1.0	+ 0.1	+ 0.6	+ 5.4
13th	+ 6.8	+ 10.5	+ 6.2	+ 8.1	+ 4.0	+ 6.9	+ 5.8	+ 1.2	+ 4.9	- 2.5	- 9.0	- 8.6	- 4.3	- 2.6	- 3.7	- 8.4	- 9.9	- 8.9	+ 2.1	+ 0.7	+ 0.1	+ 2.2	+ 3.9	+ 1.1
14th	+ 3.5	+ 7.9	+ 4.2	+ 3.7	+ 2.8	+ 7.7	+ 7.4	+ 2.5	- 0.2	+ 2.5	- 0.8	- 11.1	- 14.9	- 12.3	- 20.4	-	- 9.0	- 6.2	- 9.7	- 9.1	+ 2.7	+ 14.0	- 4.3	- 3.2
15th	+ 0.9	+ 0.1	- 1.2	- 1.4	- 3.2	- 1.8	- 1.2	- 0.9	- 3.6	- 8.4	- 13.8	- 14.9	- 13.9	- 12.6	- 6.4	- 2.4	+ 0.5	- 0.5	+ 1.3	+ 1.4	+ 2.4	+ 0.9	+ 3.2	+ 2.3
16th	+ 3.0	+ 4.9	+ 5.3	+ 5.3	+ 4.4	+ 4.5	+ 5.5	+ 4.6	+ 2.8	- 0.7	- 4.7	- 8.9	- 8.6	- 12.2	- 11.1	- 7.4	- 3.6	- 2.2	- 1.7	- 1.4	+ 2.8	0.6	- 1.4	+ 1.6
17th	+ 2.4	- 1.8	+ 1.2	+ 4.1	+ 3.2	+ 2.2	+ 3.0	+ 1.6	+ 0.9	+ 0.4	- 1.8	- 4.3	- 3.3	- 5.5	- 4.9	- 5.9	+ 0.5	- 0.1	+ 3.1	+ 4.0	+ 0.9	+ 1.0	+ 0.5	+ 5.0
18th	+ 4.9	+ 4.5	+ 5.0	+ 5.5	+ 6.0	+ 6.7	+ 7.3	+ 7.0	+ 6.7	+ 2.8	+ 2.7	+ 0.9	- 0.4	- 1.1	- 1.9	- 0.7	+ 1.8	+ 0.8	+ 1.6	+ 5.0	+ 6.4	+ 4.9	+ 4.6	+ 2.2
19th	+ 4.9	+ 3.3	+ 2.6	+ 2.7	+ 2.9	+ 2.8	+ 5.5	+ 4.3	+ 7.1	+ 1.6	- 1.5	- 1.4	- 5.1	- 7.6	- 4.9	- 3.9	- 0.9	+ 0.2	+ 2.5	+ 2.2	+ 0.3	+ 1.6	+ 2.0	+ 2.5
20th	+ 2.4	+ 5.2	+ 2.5	+ 1.4	+ 2.0	+ 3.2	+ 1.3	+ 0.6	- 0.3	- 2.6	- 1.2	- 2.9	- 4.1	- 2.8	- 4.5	- 7.6	- 6.6	- 1.5	- 1.0	+ 1.8	+ 2.6	+ 1.4	- 0.1	- 2.4
21st	+ 7.3	+ 3.4	+ 0.9	+ 1.5	+ 3.0	+ 3.4	+ 2.2	+ 4.1	+ 1.9	- 0.7	- 2.9	- 5.1	- 5.9	- 4.9	- 4.0	- 2.2	+ 0.8	+ 2.3	+ 3.8	+ 4.1	+ 4.1	+ 4.6	+ 4.0	+ 3.2
22d	+ 3.2	+ 10.1	- 3.7	+ 4.8	+ 4.4	+ 4.1	+ 5.6	+ 11.8	+ 6.6	+ 1.9	- 2.0	- 5.0	- 5.3	- 3.7	- 2.3	+ 0.3	+ 2.0	- 2.6	+ 1.4	+ 3.1	+ 4.9	+ 4.6	+ 4.6	+ 4.0
23d	+ 5.0	+ 3.9	+ 4.2	+ 6.5	+ 4.5	+ 5.2	+ 5.3	+ 5.1	+ 3.8	+ 2.6	+ 0.4	- 0.5	- 1.1	- 1.2	+ 0.3	+ 1.2	+ 1.5	+ 3.1	+ 3.8	+ 2.9	+ 3.8	+ 4.2	+ 3.9	+ 3.7
24th	+ 4.6	+ 4.6	+ 4.2	+ 4.5	+ 4.7	+ 5.2	+ 4.4	+ 5.3	+ 8.9	+ 1.6	+ 0.1	+ 0.1	- 1.2	- 0.7	- 2.7	+ 3.7	- 1.8	- 1.5	+ 1.8	+ 4.2	+ 3.3	+ 4.2	+ 4.7	+ 3.3
25th	+ 4.8	+ 5.2	+ 4.5	+ 5.3	+ 5.4	+ 4.5	+ 5.4	+ 5.4	+ 5.2	+ 3.1	+ 1.9	+ 2.2	+ 2.4	+ 0.6	+ 0.1	+ 2.0	+ 2.3	+ 4.3	+ 4.1	+ 3.5	+ 4.2	+ 5.5	+ 5.6	+ 5.6
26th	+ 5.2	+ 5.4	+ 5.9	+ 6.1	+ 6.3	+ 6.6	+ 7.3	+ 7.3	+ 6.6	+ 3.8	- 0.5	-	- 0.7	- 0.8	- 0.6	+ 2.0	+ 2.6	+ 5.0	+ 5.6	+ 6.1	+ 5.0	+ 4.9	+ 2.1	+ 2.1
27th	+ 4.5	+ 1.9	+ 2.8	+ 5.1	+ 2.9	+ 3.0	+ 2.9	+ 1.8	+ 0.7	- 1.4	- 3.6	- 6.0	- 4.9	- 7.3	- 3.1	- 6.1	- 2.5	+ 0.2	+ 1.0	- 0.5	+ 1.9	+ 1.9	+ 3.1	+ 3.6
28th	+ 3.0	+ 3.2	+ 3.4	+ 4.1	+ 4.4	+ 4.9	+ 4.8	+ 4.9	+ 3.9	+ 2.3	- 0.6	- 1.2	- 2.7	- 1.9	- 1.0	+ 0.2	+ 0.7	+ 1.1	+ 3.1	+ 3.6	+ 3.7	+ 3.8	+ 3.6	+ 7.5
29th	+ 3.5	+ 3.5	+ 3.5	+ 4.0	+ 4.5	+ 4.5	+ 4.5	+ 5.9	+ 6.4	+ 5.8	+ 3.7	+ 1.2	- 2.3	- 3.4	- 2.6	+ 0.6	+ 1.4	+ 4.2	+ 5.3	+ 5.3	+ 5.1	+ 4.9	+ 4.8	+ 5.4
30th	+ 5.4	+ 5.7	+ 5.8	+ 6.1	+ 6.3	+ 7.8	+ 11.0	+ 12.0	+ 13.1	+ 9.2	+ 7.2	+ 6.0	+ 5.2	+ 3.3	+ 1.2	- 0.5	- 5.2	+ 0.9	+ 8.3	+ 5.0	+ 1.6	+ 0.1	+ 0.8	+ 2.1
Means	+ 4.40	+ 4.82	+ 4.01	+ 4.71	+ 4.12	+ 4.62	+ 4.81	+ 4.67	+ 3.78	+ 0.97	- 0.97	- 2.55	- 3.20	- 3.30	- 2.41	- 0.79	+ 0.35	+ 1.39	+ 2.76	+ 2.91	+ 3.54	+ 3.51	+ 2.91	+ 3.32
Normals	+ 4.70	+ 4.82	+ 4.01	+ 5.02	+ 4.65	+ 4.97	+ 5.18	+ 5.07	+ 4.32	+ 1.42	- 0.50	- 2.87	- 2.43	- 2.08	- 1.66	- 1.48	+ 0.43	+ 2.37	+ 3.55	+ 3.70	+ 3.93	+ 3.53	+ 2.91	+ 2.02

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MAY 1860.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+4.2	+4.6	+3.7	+3.5	+3.2	+7.3	+5.5	+6.7	+4.8	+6.8	+5.8	+4.6	-0.6	+3.2	-0.7	+0.5	-4.7	+1.3	-1.4	-1.3	-0.2	+3.2	+7.0	+4.2
2d	+3.9	+3.8	+4.8	+4.7	+4.3	+4.6	+3.8	+4.8	+7.2	+7.0	+7.9	+2.3	-1.3	-3.4	-4.6	-2.5	+1.2	+2.5	+3.2	+4.0	+4.1	+5.1	+4.7	+4.1
3d	+4.2	+4.2	+6.3	+6.0	+5.9	+6.2	+6.3	+6.9	+8.8	+5.5	+3.3	+1.9	+0.5	-0.5	-0.9	-0.1	+2.0	+4.1	+5.2	+6.5	+6.8	+6.5	+7.1	+7.1
4th	+6.3	+6.4	+6.6	+6.9	+7.0	+7.4	+7.7	+7.8	+7.1	+5.0	+3.2	+3.4	+3.6	+1.8	+2.1	+5.2	-	+3.9	+6.4	+7.5	+7.0	+7.0	+6.9	+6.3
5th	+7.1	+6.0	+7.2	+7.0	+7.5	+8.1	+9.2	+8.6	+8.9	+7.7	+5.4	+3.3	+2.6	+2.8	+2.9	+4.2	+7.1	+7.4	+6.6	+4.5	+2.9	+0.5	-4.0	-7.2
6th	-7.9	-6.9	-2.0	-3.2	-2.0	-1.4	-0.7	+0.3	0.0	-1.4	-2.7	-3.8	+4.2	+5.6	-6.6	-7.4	-6.8	-2.7	+3.6	+5.5	+6.0	+7.4	-1.0	-1.1
7th	-3.7	-6.0	-3.0	-3.5	-2.9	-1.3	+4.6	+1.3	-0.6	-3.0	-5.2	-14.9	-13.3	-14.7	-13.7	-10.9	-14.0	-11.7	-4.7	-4.4	-2.8	-1.7	+1.4	+3.0
8th	+1.2	-0.7	0.0	+1.2	+1.1	+3.9	+4.6	+6.3	+8.2	+8.1	+3.7	+1.4	-0.2	-4.4	-1.4	-3.1	-0.2	+1.1	+2.0	+2.2	+3.1	+3.0	+4.4	+4.3
9th	+4.6	+4.5	+4.0	+4.9	+5.4	+5.9	+5.8	+6.5	+6.1	+6.6	+4.9	+1.7	-1.6	-3.9	-2.9	-0.1	+1.7	-6.3	+5.9	+5.3	+5.7	+7.7	+1.1	+2.4
10th	+2.7	+3.0	+2.1	+2.8	+4.3	+5.1	+8.3	+7.5	+8.0	+5.8	+1.4	-1.0	-4.5	-9.1	-3.6	-4.3	-5.0	-7.5	-4.5	-3.3	+2.7	+4.8	+2.4	+3.7
11th	+1.0	+1.6	+1.6	+1.8	+1.3	+7.7	+4.6	+2.9	+4.7	+3.1	-0.2	-5.5	-8.3	-5.9	-9.6	-3.6	-0.5	-0.5	-1.5	-1.5	-7.9	-11.3	-8.7	+8.5
12th	-2.8	-2.1	-1.6	+2.8	+1.9	-0.4	+0.2	-1.2	-1.8	-2.6	-2.5	-5.2	-9.2	-7.8	-8.8	-7.6	-6.3	-3.1	+0.2	+1.1	-1.5	-2.0	+1.3	+2.1
13th	+2.3	+1.9	+2.2	+7.8	+3.4	+2.1	+2.5	+3.3	+4.0	+2.0	+0.7	-2.9	-5.8	-6.0	-6.8	-4.2	-2.7	-0.8	-2.2	-2.8	-0.1	+3.0	+2.9	+0.9
14th	+2.0	+4.1	+3.4	+3.5	+3.9	+4.1	+4.6	+5.1	+5.1	+4.8	+3.6	+2.3	-2.0	-8.9	-4.2	+0.7	+0.6	-0.8	-1.1	+2.6	+3.9	+4.2	+1.0	+1.4
15th	+2.2	+3.9	+3.5	+1.7	+7.3	+4.8	+5.7	+3.5	+4.6	+3.8	+2.6	+0.3	-6.5	-4.8	+6.8	-2.2	+1.6	-5.8	+3.1	+0.3	+3.0	+3.9	+4.5	+3.7
16th	+3.8	+7.2	+5.4	+5.8	+5.6	+6.0	+6.6	+4.1	+7.5	+4.2	+0.7	-0.3	-2.9	-4.3	-2.4	+1.1	+2.0	+3.7	+4.0	+4.8	+5.5	+5.5	+5.5	+5.6
17th	+5.8	+5.6	+6.3	+6.7	+6.7	+7.5	+8.0	+7.9	+7.6	+8.6	+4.2	+1.5	-2.0	+0.1	-0.1	+1.5	+1.2	+3.4	+4.8	+4.7	+5.2	+3.4	0.0	+2.6
18th	+2.9	+5.6	+5.5	+6.2	+9.4	+11.8	+7.3	+6.5	+7.2	+6.3	+4.5	+0.9	-6.8	-7.5	-4.5	-1.8	+0.7	+2.1	+3.1	+4.1	+4.3	+5.0	+5.2	+3.9
19th	+5.1	+5.8	+6.1	+5.1	+5.4	+5.3	+7.3	+7.3	+8.2	+7.2	+6.7	+4.2	+1.5	-3.0	-3.0	-0.6	-2.0	+0.7	+2.9	+2.7	+2.1	+3.6	+4.9	+4.4
20th	+6.4	+5.7	+4.3	+4.1	+8.6	+8.6	+8.1	+7.7	+6.0	+2.6	+0.8	0.0	-1.8	-0.1	+0.7	+2.5	+0.7	+3.2	+3.7	+4.8	+4.4	+6.1	+4.9	+2.6
21st	+1.8	+2.8	-0.4	-0.1	+0.4	+1.2	+1.6	+2.7	+4.5	+4.9	+3.1	+0.7	-1.7	-3.1	-2.5	+0.7	+3.2	+3.7	+2.5	0.0	+2.6	+4.0	+5.5	+4.4
22d	+4.4	+3.8	+3.8	+4.3	+4.3	+4.9	+5.4	+5.6	+5.2	+4.7	+3.2	+3.3	+0.3	-1.3	-0.9	+1.3	+3.5	+4.0	+4.5	+4.7	+3.7	+4.1	+3.5	+4.9
23d	+5.3	+4.3	+4.5	+5.4	+8.9	+8.1	+3.5	+5.6	+5.2	+3.6	+0.1	-0.5	+0.3	+1.3	+0.3	+1.5	+3.5	+5.0	+6.2	+6.2	+6.0	+7.6	+6.5	+6.5
24th	+4.5	+7.0	+1.8	+0.2	+10.6	+1.1	+0.9	+2.0	-1.2	+4.9	+6.9	+1.5	-6.5	-9.0	-6.7	-4.9	-3.1	-0.9	-0.9	-0.9	-2.8	-8.6	-6.3	-5.6
25th	-4.8	-6.4	+2.9	-4.6	-2.6	-1.5	-0.1	-2.6	-5.4	-0.7	-0.6	-2.3	-3.7	-5.2	-2.1	-5.2	-1.4	-2.2	+0.4	+1.6	+1.4	+1.4	-0.7	-0.8
26th	+1.5	+0.5	+0.4	-1.9	-7.0	-2.1	-6.1	+3.5	+6.1	+4.0	+4.3	+3.5	+0.4	-0.8	-1.4	-0.9	+0.5	+2.1	+3.1	+2.9	+2.1	+1.7	-1.6	-1.4
27th	+2.5	+1.0	+1.6	+2.5	+3.5	+3.7	+4.6	+5.6	+6.5	+6.9	+5.2	+1.3	+1.6	-1.8	-0.7	+1.3	+3.3	-2.4	-3.5	-1.7	-3.6	-5.0	-4.4	+0.7
28th	-	-1.8	-1.2	+0.8	-	+0.3	+0.5	+0.8	+0.8	-0.1	+1.2	-1.9	-2.8	-4.7	-5.6	-1.8	+1.2	+1.7	+2.3	+3.1	+3.9	+3.2	+3.4	+3.4
29th	+3.1	+3.8	+3.5	+5.4	+4.7	+3.9	+3.4	+3.8	+3.9	+3.8	+3.8	+1.9	+1.3	-0.6	+0.5	-1.0	+1.9	+0.8	+3.2	+3.1	+1.5	+2.9	+2.7	+3.6
30th	+3.8	+4.9	+3.2	+3.9	+4.2	+2.6	+3.3	+5.3	+6.2	+7.3	+5.5	+4.5	+1.9	-0.2	-1.4	-1.1	+0.8	+2.5	+2.9	+2.0	+3.6	+3.2	+3.6	+3.2
31st	+3.4	+3.9	+2.6	+3.8	+5.0	+5.6	+5.7	+6.8	+6.8	+6.7	+6.2	+4.1	+2.6	-2.3	-1.4	-1.2	+1.6	+3.1	+3.4	+3.4	+3.1	+3.0	+2.7	+3.4
Means	+2.56	+2.65	+2.87	+3.40	+3.98	+4.23	+4.28	+4.61	+4.85	+4.33	+2.83	+0.33	-1.96	-3.54	-2.68	-1.42	-0.28	+0.37	+2.05	+2.31	+2.44	+2.66	+2.14	+2.74
Normals	+2.92	+3.62	+2.87	+3.39	+4.36	+4.23	+4.63	+4.61	+5.19	+4.33	+3.10	+0.84	-1.58	-3.17	-2.63	-1.10	+0.19	+0.78	+2.05	+2.31	+2.79	+3.71	+2.81	+3.37

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JUNE 1860.

Value of a part of division = 0.000149.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.5	+ 2.8	+ 2.8	+ 3.1	+ 4.6	+ 4.4	+ 4.5	+ 5.7	+ 4.3	+ 6.4	+ 3.0	+ 0.9	- 0.6	- 3.1	- 2.3	- 1.9	+ 1.3	+ 1.1	+ 2.0	+ 1.8	+ 1.8	+ 2.6	+ 2.6	+ 3.3
2d	+ 3.0	+ 3.6	+ 4.1	+ 6.1	+ 4.2	+ 3.4	+ 4.0	+ 4.6	+ 4.8	+ 5.7	+ 4.4	+ 2.1	- 0.8	- 6.7	- 0.8	+ 2.0	+ 1.7	+ 4.5	+ 3.7	+ 4.0	+ 3.7	+ 3.5	+ 3.0	+ 3.3
3d	+ 2.1	+ 2.9	+ 3.6	+ 3.8	+ 3.9	+ 3.9	+ 4.1	+ 6.1	+ 6.6	+ 5.7	+ 3.7	+ 1.1	- 0.8	- 0.6	- 0.2	+ 1.4	+ 4.2	+ 6.5	+ 5.2	+ 5.1	+ 6.0	+ 5.9	+ 5.7	+ 3.9
4th	+ 5.6	+ 4.7	+ 4.8	+ 5.7	+ 6.3	+ 5.8	+ 6.6	+ 7.6	+ 8.5	+ 7.4	+ 5.5	+ 3.9	+ 3.1	+ 2.7	+ 2.7	+ 4.3	+ 2.7	+ 5.1	+ 5.4	+ 5.4	+ 4.0	+ 3.4	+ 2.8	-
5th	+ 4.6	+ 5.2	+ 5.2	+ 5.8	+ 5.2	+ 5.7	+ 6.0	+ 4.1	+ 7.4	+ 6.4	+ 2.7	+ 1.7	- 0.2	- 1.3	- 2.0	- 3.0	- 1.0	+ 0.9	- 2.3	- 0.3	+ 2.7	- 8.5	+ 0.8	+ 2.1
6th	+ 7.3	0.0	+ 0.7	+ 2.1	+ 2.4	+ 2.5	+ 3.3	+ 5.1	+ 5.7	+ 4.2	+ 2.4	+ 1.5	- 2.1	- 2.6	+ 5.1	+ 6.0	+ 3.7	+ 3.4	+ 2.2	+ 2.9	+ 2.5	+ 3.9	+ 4.1	+ 4.8
7th	+ 4.9	+ 4.8	+ 4.6	+ 4.8	+ 5.0	+ 5.7	+ 5.3	+ 5.9	+ 7.7	+ 5.8	+ 2.7	+ 0.9	- 0.7	- 2.0	- 2.3	- 6.0	- 2.1	+ 0.5	+ 0.8	- 0.1	+ 0.9	+ 1.8	+ 0.8	+ 2.0
8th	+ 2.5	+ 6.6	- 4.6	+ 3.5	+ 2.7	+ 3.5	+ 2.6	-	+ 2.4	+ 5.5	+ 3.2	+ 0.8	- 2.9	-	- 7.5	- 4.6	- 2.3	+ 0.2	+ 0.6	0.0	- 1.0	+ 1.5	+ 0.6	+ 1.7
9th	+ 2.0	+ 2.0	+ 3.1	+ 6.2	+ 4.3	+ 3.3	+ 3.7	-	+ 3.7	+ 1.7	+ 0.5	-	- 1.5	- 4.1	- 5.1	- 2.5	+ 1.4	+ 0.2	+ 0.8	+ 0.5	+ 2.5	+ 2.7	+ 1.8	+ 1.3
10th	+ 1.2	+ 2.4	+ 2.6	+ 2.9	+ 3.5	+ 4.1	+ 4.9	+ 5.2	+ 6.1	+ 6.4	+ 5.4	+ 4.7	- 0.2	+ 0.3	- 0.3	+ 3.9	+ 1.2	+ 4.3	+ 5.4	+ 5.0	+ 4.7	+ 2.0	+ 1.5	+ 3.0
11th	+ 3.9	+ 2.1	+ 3.7	+ 4.0	+ 3.9	+ 4.9	+ 5.1	+ 5.8	+ 6.7	+ 6.9	+ 5.6	+ 1.8	- 6.4	- 1.8	- 2.9	- 12.9	- 7.6	- 5.8	- 12.7	- 14.5	- 17.1	- 13.4	- 10.5	- 13.1
12th	- 3.9	- 3.0	- 3.6	- 3.6	- 0.4	- 0.5	+ 0.5	0.0	- 1.3	- 2.1	- 4.2	- 1.9	- 1.4	- 3.0	- 3.4	- 2.4	- 0.8	+ 0.2	+ 0.6	- 1.7	- 0.3	+ 0.7	+ 0.4	+ 2.2
13th	+ 1.8	+ 1.5	+ 2.0	+ 1.8	+ 2.4	+ 2.3	+ 1.0	+ 3.6	+ 4.9	+ 4.4	+ 2.5	- 0.3	- 1.4	- 4.3	- 2.9	- 2.2	0.0	+ 1.7	+ 2.1	+ 1.4	+ 2.5	+ 2.5	+ 2.5	+ 2.9
14th	+ 3.0	+ 3.6	+ 3.8	+ 3.5	+ 4.4	+ 3.4	+ 4.3	+ 4.6	+ 4.7	+ 5.4	+ 5.5	+ 3.0	+ 2.2	+ 1.3	- 0.5	- 0.9	+ 1.3	+ 2.5	+ 1.9	+ 3.9	+ 3.2	+ 3.5	+ 3.8	+ 4.2
15th	+ 4.5	+ 4.4	+ 4.4	+ 5.4	+ 5.5	+ 5.6	+ 6.3	+ 7.0	+ 7.6	+ 8.3	+ 6.1	+ 4.0	+ 2.4	+ 1.7	- 0.2	+ 0.3	- 1.6	+ 2.0	+ 4.6	+ 5.0	+ 4.9	+ 4.5	+ 4.8	+ 5.2
16th	+ 5.0	+ 5.1	+ 5.9	+ 6.1	+ 7.1	+ 8.3	+ 7.9	+ 3.3	+ 9.4	+ 9.0	+ 6.4	+ 4.3	+ 2.3	+ 2.5	+ 3.0	+ 5.0	+ 6.0	+ 5.1	+ 7.1	+ 6.3	+ 5.9	+ 5.9	+ 5.8	+ 5.6
17th	+ 5.6	+ 5.8	+ 6.2	+ 6.2	+ 6.8	+ 6.9	+ 7.0	+ 7.2	+ 7.2	+ 7.2	+ 6.9	+ 5.2	+ 3.1	+ 1.1	+ 1.8	+ 2.3	+ 3.3	+ 4.6	+ 2.3	+ 1.8	+ 0.3	+ 1.1	+ 1.1	+ 1.6
18th	+ 1.3	+ 1.3	+ 3.4	+ 4.1	+ 4.4	+ 5.0	+ 5.1	+ 7.0	+ 7.8	+ 7.5	+ 6.4	+ 4.2	+ 1.4	0.0	- 0.5	- 0.5	+ 3.8	+ 4.3	+ 3.4	+ 1.5	+ 0.5	+ 5.1	+ 3.8	+ 1.9
19th	+ 1.8	+ 1.8	+ 4.3	+ 5.0	+ 4.5	+ 3.1	+ 6.4	+ 6.4	+ 3.5	+ 4.6	+ 3.1	+ 0.2	- 2.4	- 3.2	- 3.3	+ 0.6	+ 1.6	+ 3.2	+ 3.8	+ 2.9	+ 3.7	+ 1.7	+ 1.9	+ 1.7
20th	+ 2.9	+ 3.1	+ 4.1	+ 3.3	+ 3.2	+ 3.5	+ 2.5	+ 3.5	+ 5.2	+ 4.3	+ 3.3	+ 3.4	+ 3.1	+ 0.6	- 1.0	+ 0.2	+ 2.2	- 0.2	+ 5.4	+ 5.8	+ 5.8	+ 5.5	+ 5.4	+ 5.5
21st	+ 5.2	+ 5.5	+ 4.7	+ 4.6	+ 4.5	+ 4.8	+ 5.6	+ 6.2	+ 6.6	+ 6.5	+ 5.2	+ 4.9	+ 5.1	+ 4.3	+ 3.0	+ 4.0	+ 6.5	+ 7.1	+ 7.3	+ 7.3	+ 6.4	+ 5.5	+ 1.2	+ 1.3
22d	+ 2.3	+ 0.8	+ 3.8	+ 4.8	+ 5.8	+ 4.5	+ 5.1	+ 4.4	+ 6.1	+ 7.5	+ 5.7	- 2.0	+ 0.3	+ 1.8	+ 1.2	+ 1.8	+ 3.9	+ 3.4	+ 2.8	+ 4.1	+ 4.3	+ 3.7	+ 3.3	+ 3.9
23d	+ 4.2	+ 4.3	+ 4.7	+ 5.3	+ 5.7	+ 5.8	+ 5.9	+ 6.1	+ 7.4	+ 7.4	+ 7.3	+ 5.6	+ 1.7	-	+ 0.1	+ 0.2	+ 5.5	+ 5.1	+ 4.1	+ 6.3	+ 6.3	+ 6.1	+ 5.8	+ 6.7
24th	+ 5.4	+ 5.9	+ 6.2	+ 6.4	+ 6.4	+ 6.4	+ 5.6	+ 8.0	+ 8.7	+ 9.4	+ 8.7	+ 7.4	+ 5.4	+ 4.6	+ 3.6	+ 3.9	+ 4.7	+ 6.2	+ 5.9	+ 6.2	+ 5.8	+ 5.5	+ 5.2	+ 4.8
25th	+ 2.4	+ 2.9	+ 5.1	+ 3.2	+ 2.3	+ 3.2	+ 5.8	+ 5.8	+ 7.0	+ 6.5	+ 3.5	+ 1.4	- 1.1	- 1.4	- 2.6	- 1.2	+ 2.3	+ 2.4	+ 0.7	+ 1.7	+ 1.8	+ 2.3	+ 3.4	-
26th	+ 3.4	+ 4.3	+ 4.2	+ 5.3	+ 5.0	+ 4.6	+ 5.5	+ 4.7	+ 6.4	+ 7.7	+ 4.8	+ 3.1	+ 0.2	- 2.2	- 2.5	- 1.5	+ 1.7	+ 2.8	+ 2.0	+ 3.2	+ 3.1	+ 4.2	+ 4.5	+ 4.7
27th	+ 5.0	+ 4.7	+ 4.7	+ 5.0	+ 5.5	+ 5.8	+ 6.1	+ 6.4	+ 8.0	+ 6.9	+ 3.5	+ 0.5	- 1.3	- 0.9	- 1.0	+ 1.8	+ 4.4	+ 9.0	+ 5.6	+ 3.3	+ 4.6	+ 5.5	+ 5.2	+ 3.8
28th	+ 3.8	+ 5.6	+ 6.1	+ 5.7	+ 5.6	+ 5.5	+ 5.7	+ 6.2	+ 8.5	+ 7.0	+ 3.9	+ 2.7	- 1.0	- 3.4	- 3.4	+ 1.4	+ 4.5	+ 5.6	+ 5.6	+ 6.7	+ 6.9	+ 7.9	+ 6.8	+ 5.2
29th	+ 5.9	+ 5.5	+ 4.9	+ 5.1	+ 5.6	+ 6.2	+ 6.0	+ 5.5	+ 8.0	+ 6.6	+ 6.8	+ 4.7	+ 2.3	- 1.3	- 5.6	- 2.2	+ 0.7	+ 2.3	+ 2.8	+ 2.7	+ 3.6	+ 3.7	+ 4.0	+ 3.6
30th	+ 4.3	+ 4.3	+ 4.0	+ 4.8	+ 5.1	+ 5.3	+ 5.2	+ 6.2	+ 1.0	+ 10.3	+ 11.3	+ 0.5	- 2.4	+ 0.9	+ 1.7	- 8.9	- 2.0	- 20.2	- 17.7	- 17.5	- 13.8	- 17.3	- 14.8	- 8.1
Means	+ 3.48	+ 3.48	+ 3.65	+ 4.33	+ 4.51	+ 4.56	+ 4.92	+ 5.44	+ 6.10	+ 6.28	+ 4.57	+ 2.36	+ 0.18	- 0.72	- 0.94	- 0.39	+ 1.71	+ 2.27	+ 2.05	+ 2.02	+ 2.21	+ 2.10	+ 2.26	+ 2.46
Normals	+ 3.48	+ 3.48	+ 3.93	+ 4.33	+ 4.51	+ 4.56	+ 4.92	+ 5.44	+ 6.10	+ 6.57	+ 4.87	+ 2.36	+ 0.18	- 0.72	- 0.94	+ 0.36	+ 2.03	+ 3.36	+ 3.28	+ 3.31	+ 3.47	+ 3.79	+ 3.33	+ 3.47

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JULY 1860.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	-6.9	-10.6	-7.8	-8.0	-7.0	-5.5	-5.8	-3.0	-1.8	+0.5	-13.0	-18.8	-19.2	-15.4	-14.7	-10.6	-12.9	-6.5	-5.8	+3.4	+7.4	-30.6	-20.8	-21.6
2d	-15.5	-16.4	-20.7	-15.2	-13.6	-16.7	-1.5	-2.0	-9.9	-13.6	-13.6	-15.7	-14.6	-14.1	-12.5	-12.2	-4.5	-9.6	-9.5	-13.7	-9.4	-8.5	-8.8	-8.4
3d	-6.1	-5.5	-6.7	-6.6	-3.7	-1.3	+2.5	+1.7	+1.8	+2.4	+1.4	+2.1	-7.9	-32.5	-13.9	-9.5	-7.4	-9.7	-2.5	-15.4	-13.5	-9.5	-7.5	-1.0
4th	-5.3	-6.8	-3.2	-2.5	-8.3	-6.0	-3.9	-2.2	-1.1	+7.4	-4.6	-0.1	-6.6	-7.5	-6.1	-2.3	-1.3	+0.9	+1.0	-0.9	-0.2	-0.1	-1.8	-1.5
5th	-0.5	+0.4	+0.6	+3.5	+6.1	-1.2	-0.3	+1.6	-1.5	-2.6	-7.0	-19.1	-9.2	-16.9	-24.3	-14.1	-9.4	-10.0	-9.2	-8.2	-7.2	-12.5	-24.8	-23.2
6th	-20.3	-22.0	-18.6	-17.5	-15.6	-13.2	-14.1	+8.0	+2.1	-11.2	-15.1	-16.0	-16.2	-13.7	-13.8	-13.4	-6.0	-3.4	-4.3	-4.7	-4.6	-4.3	-3.4	-3.8
7th	-4.1	+0.6	-4.2	-4.0	-3.4	-2.6	-2.6	+2.3	-2.2	-3.2	-5.0	-7.4	-7.4	-6.7	-3.5	-1.6	-1.7	-0.7	-0.7	-1.1	-0.2	-1.1	-0.1	-1.5
8th	-1.5	-1.0	+0.2	+0.1	+3.0	+2.6	+1.7	+2.6	+3.0	+1.2	-2.6	-4.8	-4.6	-2.1	-1.3	-0.6	-1.6	+1.1	+0.8	+0.6	-7.1	+1.1	+1.0	+0.4
9th	+0.2	+1.2	+1.6	+2.1	+2.7	+3.1	+4.0	+6.0	+6.9	+5.3	+2.9	-0.6	-2.7	-5.5	-4.4	-	+1.6	-1.7	+1.6	+2.5	+1.5	+1.4	+0.7	+3.9
10th	+2.2	+2.5	+3.0	+3.0	+2.5	+3.6	+3.1	+4.9	+5.3	+3.3	+1.1	-1.4	-2.3	-1.5	+0.1	+2.1	+2.6	+3.1	+3.0	+3.3	+3.4	+3.4	+3.5	+3.1
11th	+3.9	+3.0	+3.4	+4.4	+4.6	+4.9	+4.8	+6.7	+7.2	+6.0	+3.8	+1.8	+2.1	+2.6	+5.2	+6.3	+5.6	+6.5	+6.8	+6.1	+5.3	+5.3	+6.2	+5.4
12th	+5.8	+6.3	+6.9	+5.3	+6.0	+7.4	+6.7	+7.3	+6.9	+14.6	+21.2	+11.7	+10.5	+7.2	+1.7	+3.1	+3.5	-12.2	-12.3	-14.0	-6.7	-8.3	-10.0	-8.9
13th	-7.4	+3.0	-4.0	-3.1	-1.0	-0.4	+1.4	+3.0	+3.9	+2.5	+1.3	+4.3	+1.8	-0.7	-0.8	+1.4	+3.0	+3.7	+4.3	+5.2	+4.4	+4.4	+4.4	+4.2
14th	+2.9	+4.7	+3.7	+4.3	+2.3	+4.1	+4.3	+4.5	+5.3	+6.6	+6.5	+4.0	+2.8	+5.0	+7.4	+9.4	+8.5	+7.4	+7.3	+7.0	+6.6	+6.6	+6.6	+7.0
15th	+7.1	+7.9	+7.8	+8.2	+8.3	+7.9	+8.1	+7.3	+8.5	+8.5	+7.6	+2.5	-0.2	-0.7	+2.0	+4.9	+7.5	+6.6	+6.4	+7.3	+7.3	+6.9	+6.5	+6.5
16th	+6.6	+6.7	+7.0	+6.8	+7.3	+6.3	+7.4	+8.6	+8.6	+7.8	+6.1	+4.2	-	-	+6.2	+5.5	+6.1	+5.9	+5.8	+6.3	+4.4	+4.5	+4.4	+4.5
17th	+5.9	+5.0	+4.7	+5.5	+5.8	+7.5	+7.1	+9.0	+10.2	+11.4	+9.1	+5.7	+4.0	+2.3	+1.0	+3.5	+5.5	+6.4	+7.4	+5.3	+6.6	+4.1	+2.4	+5.5
18th	+5.6	+5.6	+5.8	+4.6	+4.8	+3.7	+5.6	+3.7	+6.3	+7.2	+4.6	-3.1	-6.3	+2.1	+0.5	+3.2	+2.7	+1.9	+2.7	+4.5	+3.9	+4.7	+5.9	+5.5
19th	+5.2	+3.5	+5.9	+7.2	+7.2	+7.2	+9.7	+9.8	+11.6	+10.6	+9.5	+6.8	+5.9	+1.8	+1.4	+4.5	+5.7	+7.7	+5.1	+5.9	-0.1	-2.3	+1.7	+5.2
20th	+3.6	+4.7	+7.4	+7.9	+9.4	+6.2	+6.2	+8.0	+5.2	+6.5	+14.5	+2.5	+2.8	0.0	-2.6	+0.8	+1.5	+4.2	+6.7	+7.3	+7.2	+6.9	+5.5	+5.6
21st	+5.4	+4.8	+4.4	+10.8	+7.7	+6.5	+5.7	+4.9	+6.6	+4.5	+3.5	+1.8	-2.9	-5.2	-4.8	-4.5	+2.7	+4.1	+1.4	+1.9	+3.0	+5.2	+5.0	+6.5
22d	+5.1	+5.4	+4.8	+4.9	+6.9	+7.8	+6.0	+7.5	+8.9	+8.6	+8.8	+4.8	+2.8	-0.2	+1.2	+0.9	+0.5	+4.9	+5.0	+1.3	+4.6	+5.1	+6.7	+7.2
23d	+7.6	+5.8	+5.8	+5.7	+5.8	+6.0	+6.2	+6.2	+7.3	+7.7	+7.8	+5.0	+0.9	-1.9	-1.8	+2.0	+6.0	+8.2	+5.9	+5.8	+1.9	+2.4	+6.2	+5.9
24th	+4.3	+5.2	+4.6	+8.0	-	+6.5	+7.3	+5.6	+6.8	+9.3	+8.4	+4.3	+0.9	+0.1	+1.0	+3.4	+6.8	+1.1	+4.5	+3.1	+3.8	+2.1	+2.1	+1.2
25th	+4.2	+4.5	+3.5	+4.3	+4.2	+4.3	+4.5	+5.3	+7.2	+7.8	+5.9	+3.8	+0.7	-0.5	+0.7	+1.3	+4.4	+6.8	+7.1	+6.4	+6.3	+6.4	+5.8	+6.1
26th	+6.4	+6.3	+6.4	+5.8	+6.1	+6.3	+7.3	+7.6	+8.8	+8.4	+5.9	+1.0	-0.2	-1.5	+0.2	+2.3	+6.1	+6.2	+5.6	+5.9	+5.2	+5.8	+5.6	+6.2
27th	+6.5	+8.1	+8.4	+7.7	+8.0	+8.2	+8.3	+9.6	+9.3	+9.4	+7.6	-	+0.2	-4.2	-0.2	+4.8	+6.8	+6.0	+5.8	+6.9	+4.4	+2.2	+5.2	+6.2
28th	+6.0	+4.5	+6.5	+7.3	+7.7	+8.4	+8.0	+8.0	+8.8	+8.2	+6.7	+3.1	+0.5	-0.2	+0.6	+4.2	+5.2	+6.6	+7.4	+6.7	+6.2	+6.4	+7.0	+7.4
29th	+7.5	+7.3	+7.5	+7.7	+8.3	+8.5	+9.4	+11.0	+12.0	+10.8	+8.4	+8.9	+6.7	+7.5	+6.8	+7.7	+8.5	+9.4	+11.2	+9.3	+7.5	+6.1	+5.0	+6.6
30th	+4.5	+5.4	+11.1	+7.0	+8.5	+9.3	+8.9	+12.4	+9.7	+13.8	+13.9	+12.1	+7.2	+5.3	+3.1	+0.7	+4.7	+5.2	+4.4	+4.2	+6.4	+7.5	+5.9	+5.3
31st	+6.7	+7.3	+8.6	+9.3	+8.8	+9.0	+9.9	+11.6	+9.2	+11.5	+10.4	+6.6	+2.9	+3.5	+2.5	+5.0	+8.4	+9.7	-	+9.4	+9.5	+8.6	+7.6	+7.8
Means	+1.47	+1.85	+2.08	+2.73	+2.98	+3.17	+4.06	+5.73	+5.51	+5.52	+3.75	+0.33	-1.71	-3.15	-2.04	+0.27	+2.23	+2.25	+2.43	+2.18	+2.18	+0.96	+1.09	+1.64
Normals	+4.63	+4.57	+5.15	+5.34	+5.88	+5.18	+5.64	+6.60	+6.60	+6.94	+6.08	+2.47	-0.71	-1.24	-0.19	+2.44	+4.20	+4.53	+4.28	+4.75	+4.65	+4.14	+4.06	+4.49

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF AUGUST 1860.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 8.6	+ 8.6	+ 6.7	+ 9.2	+ 5.1	+ 5.4	+10.6	+11.3	+11.7	+10.0	+ 7.3	+ 5.2	+ 4.4	+ 3.5	+ 4.4	+ 6.3	+ 5.8	+ 9.8	+10.4	+11.4	+11.4	+11.6	+10.5	+10.1
2d	+ 9.6	+14.7	+13.0	+12.5	+12.8	+15.6	+15.4	+14.8	+16.6	+14.8	+10.4	+ 7.1	+ 5.2	+ 1.7	+ 0.6	+ 2.4	+ 1.1	0.0	+ 0.6	+ 2.8	- 2.4	- 2.3	+ 4.3	+ 4.1
3d	+ 5.3	+ 4.6	+ 4.5	+ 6.7	+ 7.0	+ 6.5	+ 7.8	+ 9.5	+10.7	+ 9.8	+ 8.8	+ 0.2	+ 1.1	- 1.1	- 1.4	+ 2.1	+ 3.5	+ 4.7	-	+ 5.7	+ 6.3	+ 6.1	+ 6.2	+ 7.2
4th	+ 9.4	+ 7.5	+ 6.8	+ 6.5	+ 6.4	+ 6.3	+ 7.8	+ 9.5	+ 9.2	+ 7.7	+ 6.6	+ 3.5	+ 0.5	+13.5	- 1.1	+ 1.9	+ 4.8	+ 6.0	+ 6.3	+ 6.5	+ 7.4	+ 7.4	+ 7.4	+ 8.1
5th	+ 7.8	+ 7.3	+ 8.0	+ 6.5	+ 7.8	+ 8.4	+ 9.1	+ 8.8	+ 9.5	+ 3.8	+ 3.9	+ 3.7	+ 4.4	+ 2.7	- 0.1	+ 3.1	+ 2.2	+ 4.7	+ 6.2	+ 6.1	+ 3.6	+ 5.4	+ 6.3	+ 6.3
6th	+ 7.3	+12.0	+ 8.1	+ 8.1	+ 7.6	+ 8.5	+ 9.1	+10.0	+10.8	+ 9.4	+ 8.1	+ 6.1	+ 2.2	+ 0.2	+ 0.6	+ 3.2	+ 4.3	+ 5.8	+ 7.4	+ 5.4	+ 5.3	+ 6.7	+ 7.4	+ 7.1
7th	+ 7.4	+ 6.0	+ 7.4	+10.0	+ 9.0	+ 8.1	+ 8.3	+10.0	+11.8	+ 9.3	+11.9	+11.4	+ 5.0	+ 7.3	+ 3.3	- 0.5	+16.8	- 1.7	+10.3	-	-18.8	-13.2	-24.7	-18.7
8th	-36.0	-29.7	-20.5	-20.9	-18.2	-16.0	-13.4	-24.7	-14.5	-18.6	-14.7	-15.5	-14.9	-11.7	-12.2	-11.4	-11.7	-11.4	-13.7	- 5.7	- 0.8	- 4.6	+ 3.3	+14.8
9th	+12.4	- 4.1	+30.6	-10.0	-14.0	-29.8	-	-13.9	-11.2	- 0.2	- 8.3	+ 0.2	- 2.1	-10.7	- 3.0	- 8.5	- 6.3	-14.7	- 2.5	- 4.8	- 5.3	+ 1.0	+ 4.2	- 0.8
10th	+27.2	-10.9	- 8.8	-10.6	+12.2	-13.2	-13.3	- 5.9	- 5.6	- 3.4	+ 1.2	+ 3.3	+ 1.8	- 5.9	- 4.0	- 3.7	- 4.2	- 5.7	- 3.8	- 5.8	- 1.5	- 8.7	- 4.7	- 0.3
11th	- 1.7	+ 0.2	+ 4.2	- 7.0	- 9.8	- 2.8	- 1.4	+ 3.2	+ 1.6	-31.8	- 1.2	+ 7.4	+ 0.9	- 5.8	- 8.8	- 9.8	+ 3.2	- 4.1	-18.8	- 5.0	- 2.3	- 3.5	- 4.5	- 5.5
12th	- 4.4	- 4.7	- 3.9	- 1.3	- 0.6	- 0.9	- 0.9	+ 4.1	+ 0.7	- 3.3	- 6.5	- 8.6	+ 1.9	- 7.7	- 8.5	- 9.1	-15.6	- 7.9	-10.4	-11.4	- 6.8	+24.3	-23.4	-20.8
13th	+ 0.1	-18.8	-25.3	-27.9	-24.6	-49.9	-30.9	-27.2	-25.9	-22.6	-14.9	-19.3	-29.0	-18.0	-16.0	-17.9	-11.9	- 8.2	- 8.3	+11.1	-12.9	-10.6	-18.7	-10.1
14th	-14.8	-15.8	-13.0	- 9.5	- 7.1	-	- 2.0	- 2.8	- 2.5	- 2.2	- 0.7	- 1.7	- 4.1	- 3.4	- 5.5	- 5.2	- 3.1	- 1.0	- 1.5	+ 0.6	+ 3.9	+ 2.4	+ 1.9	+ 0.9
15th	+ 1.0	+ 1.0	+ 2.0	+ 3.0	+ 2.9	+ 2.6	+ 3.1	+ 5.4	+ 6.3	+ 7.8	+ 2.0	+ 1.4	+ 1.9	+ 1.0	- 1.1	- 2.8	+ 0.9	+ 2.9	+ 3.1	+ 3.8	+ 4.0	+ 3.9	+ 3.1	+ 3.1
16th	+ 2.5	+ 3.3	+ 3.4	+ 3.9	+ 3.8	+ 3.9	+ 4.9	+ 6.6	+ 7.5	+ 7.7	+ 5.6	+ 2.9	+ 1.6	- 1.2	- 2.9	- 1.4	+ 0.1	+ 2.5	+ 3.3	+ 4.0	+ 4.7	+ 4.4	+ 3.9	+ 3.9
17th	+21.1	+ 4.1	+ 4.9	+ 1.4	+ 1.6	- 5.3	-26.0	+ 0.1	+ 0.7	+ 1.5	- 2.2	+ 1.7	- 5.4	- 5.9	- 5.5	- 4.9	- 3.3	- 1.7	- 1.6	- 0.2	+ 0.3	+ 0.4	+ 0.2	- 0.1
18th	+ 0.7	- 0.1	+ 0.9	+ 1.3	+ 2.1	+ 2.6	+ 3.5	+ 6.0	+ 7.1	+ 5.7	+ 2.9	+ 1.6	+ 0.9	- 1.6	- 1.6	- 1.4	+ 0.2	+ 2.3	+ 3.6	+ 4.8	+ 3.5	+ 2.4	+ 3.4	+ 5.7
19th	+ 2.8	+ 2.5	+ 3.1	+ 4.5	+ 5.5	+ 5.6	+ 7.4	+ 3.6	-	+ 3.8	+ 1.4	- 3.5	- 6.3	- 6.3	- 6.2	- 6.5	- 2.9	+ 1.4	- 3.3	- 6.1	- 7.5	- 3.8	+ 4.2	- 1.6
20th	- 0.1	+ 7.4	+ 7.5	+ 0.4	- 0.7	+ 3.0	+ 5.6	0.0	+ 7.7	+ 7.3	+ 4.9	+ 3.8	0.0	- 1.0	- 1.1	+ 0.7	+ 2.7	+ 4.8	+ 5.3	+ 5.3	+ 3.8	+ 4.1	+ 0.3	+ 1.8
21st	+ 2.3	+ 0.8	+ 5.4	+ 3.0	+ 4.3	+ 3.8	+ 5.2	+ 6.8	+ 6.5	+ 5.2	+ 3.1	+ 2.5	+ 1.2	0.0	- 0.7	- 2.8	+ 0.6	+ 3.3	+ 4.2	+ 4.2	+ 4.7	+ 5.0	+ 4.5	+ 4.4
22d	+ 5.8	+ 4.8	+ 5.0	+ 5.5	+ 5.9	+ 7.7	+ 6.4	+ 9.0	+13.4	+ 9.0	+ 6.0	+ 3.2	+ 3.3	+ 2.1	- 2.2	- 2.1	+ 0.1	+ 1.9	+ 0.3	- 1.9	- 4.9	- 1.0	- 1.1	+ 2.6
23d	+ 6.2	+ 2.8	+ 1.5	+ 2.0	+ 3.0	+ 4.0	+ 4.0	+ 4.9	+ 5.8	+ 6.1	+ 5.2	+ 3.5	+ 1.2	- 3.3	- 6.2	- 0.9	+ 1.0	+ 3.9	+ 4.1	+ 8.0	+ 4.8	+ 4.7	+ 4.2	+ 3.3
24th	+ 3.2	+ 5.6	+ 4.1	+ 4.9	- 2.0	- 1.4	- 1.1	-	+10.4	+ 7.7	- 0.3	+ 0.9	- 1.5	- 0.5	+ 0.1	+ 0.7	+ 4.8	+ 4.5	+ 5.4	+ 2.4	+ 1.8	+ 3.8	+ 3.9	+ 4.8
25th	+ 5.2	+ 7.8	+ 5.8	+10.0	+ 6.1	+ 8.6	+ 1.4	+ 7.8	+ 7.1	+ 7.7	+ 2.9	+ 1.8	- 0.3	- 0.5	- 1.2	- 0.7	+ 2.2	+ 2.7	+ 4.7	+ 5.0	+ 5.2	+ 4.9	+ 3.9	+ 4.9
26th	+ 4.8	+ 6.4	+ 6.4	+ 5.4	+ 5.5	+ 6.4	+ 6.7	+ 7.6	+ 7.8	+ 5.6	+ 2.1	- 0.3	- 1.0	- 1.9	- 2.1	+ 2.9	+ 4.6	+ 4.6	+ 3.5	+ 3.5	+ 4.5	+ 6.0	+ 9.6	+ 6.6
27th	+ 6.3	+ 6.1	+ 6.5	+ 6.5	+ 7.6	+ 8.1	+ 8.5	+ 7.9	+ 6.2	+ 9.6	+ 2.6	+ 0.1	- 2.3	- 1.4	+ 0.9	+ 3.7	+ 5.2	+ 3.9	+ 4.5	+ 4.7	+ 6.9	+ 6.4	+ 7.1	+ 5.9
28th	+ 7.1	+ 7.0	+ 7.5	+ 6.7	+ 6.8	+ 7.0	+ 8.7	+ 9.1	+ 9.3	+ 9.4	+ 8.1	+ 6.0	+ 2.3	- 1.5	- 1.4	+ 2.2	+ 6.2	+ 6.5	+ 6.5	+ 7.2	+ 7.3	-	-	-
29th	-	- 3.3	-	-	-	-	-	+11.0	+11.2	+10.2	+ 8.2	+ 7.6	+ 6.1	+ 4.2	+ 5.1	+ 4.2	+ 3.3	+ 5.3	+ 8.7	+ 8.4	+ 8.4	+ 7.6	+ 6.9	+ 6.9
30th	+ 7.0	+ 4.3	+11.0	+ 8.4	+ 8.1	+ 8.2	+ 8.2	+ 9.2	+ 9.4	+ 8.9	+ 8.4	+ 9.8	+ 9.9	+ 7.3	+ 7.4	+ 4.5	+ 7.5	+ 8.3	+ 8.3	+ 9.4	+ 9.4	+ 8.2	+ 1.9	+ 0.4
31st	+ 6.1	+ 8.8	+ 2.9	+ 4.8	+ 8.1	+ 6.1	+ 7.2	+ 9.0	+ 3.4	- 0.9	+ 8.8	+ 6.0	+ 1.7	+ 0.8	- 0.1	+ 1.5	+ 3.9	+ 6.3	+ 6.3	+ 5.0	+ 4.9	+ 5.6	+ 4.0	+ 4.0
Means	+4.01	+1.49	+3.19	+1.47	+2.09	+0.59	+2.07	+3.69	+4.76	+3.06	+2.63	+1.68	-0.30	-1.45	-2.27	-1.62	+0.84	+1.28	+1.62	+2.81	+1.58	+2.82	+1.18	+1.97
Normals	+4.78	+4.52	+5.37	+4.64	+4.84	+4.87	+5.11	+6.63	+6.99	+6.34	+4.39	+2.85	+0.88	-1.31	-1.78	+0.25	+2.10	+3.11	+3.29	+4.58	+3.90	+3.25	+3.97	+3.72

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF SEPTEMBER 1860.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 5.6	+ 3.6	+ 4.9	+ 5.8	+ 6.1	+ 5.9	+ 5.9	+ 7.1	+ 4.2	+ 3.7	+ 5.5	+ 6.8	+ 4.4	+ 0.7	+ 0.1	+ 0.8	+ 1.8	+ 2.6	+ 4.7	+ 5.7	+ 5.2	+ 5.3	+ 6.2	+ 6.3
2d	+ 5.6	+ 5.5	+ 7.7	+ 6.8	+ 4.3	+ 6.6	—	+ 9.4	+ 7.2	+ 5.6	+ 2.6	+ 1.8	+ 1.4	+ 1.5	+ 2.5	+ 3.4	+ 2.1	+ 3.3	+ 5.4	+ 6.4	+ 4.3	+ 5.4	+ 4.1	+ 4.2
3d	+ 5.9	+ 5.9	+ 5.5	+ 11.4	+ 8.9	+ 5.7	+ 7.3	+ 8.6	+ 9.4	+ 8.3	+ 1.7	+ 0.2	+ 0.6	+ 1.8	+ 1.8	+ 1.7	+ 0.2	+ 4.1	+ 5.0	+ 5.4	+ 6.7	+ 6.3	+ 5.9	+ 7.1
4th	+ 5.5	+ 5.5	+ 6.1	+ 7.4	+ 5.3	+ 5.5	+ 7.3	+ 7.3	+ 6.1	+ 4.1	+ 1.6	+ 0.0	+ 1.5	+ 3.0	+ 0.7	+ 2.2	+ 1.6	+ 5.3	+ 5.7	+ 5.2	+ 6.2	+ 6.7	+ 6.1	+ 6.1
5th	+ 11.7	+ 10.9	+ 10.0	+ 12.1	+ 6.1	+ 6.6	—	+ 1.1	+ 7.1	+ 8.4	+ 5.7	+ 0.0	+ 2.2	+ 2.3	+ 0.6	+ 0.7	+ 0.5	+ 1.1	+ 0.5	+ 1.3	+ 0.8	+ 1.0	+ 5.0	+ 2.1
6th	+ 1.1	+ 0.6	+ 0.6	+ 0.7	+ 1.2	+ 1.9	+ 2.5	+ 3.9	+ 4.3	+ 3.3	+ 1.4	+ 5.2	+ 7.0	+ 4.5	+ 23.0	+ 2.1	+ 3.9	+ 3.7	+ 3.3	+ 4.8	+ 4.7	+ 4.7	+ 5.5	+ 5.7
7th	+ 5.2	+ 3.6	+ 2.9	+ 3.2	+ 4.4	+ 4.6	+ 4.3	+ 22.3	+ 15.4	+ 0.3	+ 7.0	+ 12.9	+ 25.6	+ 14.3	+ 26.5	+ 21.4	+ 28.4	+ 24.6	+ 41.2	+ 32.6	+ 8.6	+ 17.4	+ 5.4	+ 24.5
8th	+ 11.4	—	+ 24.8	+ 23.9	+ 15.4	+ 12.5	+ 13.5	+ 12.1	+ 9.2	+ 17.4	+ 14.2	+ 16.8	+ 15.5	+ 17.1	+ 13.5	+ 10.7	+ 4.4	+ 4.4	+ 1.8	+ 4.2	+ 3.7	+ 3.9	+ 2.0	+ 0.8
9th	+ 0.4	+ 1.9	+ 3.9	+ 0.7	+ 8.2	+ 6.7	+ 6.7	+ 1.2	+ 0.6	+ 0.9	+ 1.8	+ 2.3	+ 2.5	+ 2.3	+ 2.7	+ 1.7	+ 8.8	+ 6.6	+ 15.4	+ 11.2	+ 3.0	+ 2.3	+ 4.1	+ 0.3
10th	+ 2.1	+ 1.1	+ 0.9	+ 1.4	+ 1.9	+ 1.5	+ 1.0	+ 3.0	+ 0.8	+ 1.2	+ 0.3	+ 1.6	+ 3.4	+ 5.4	+ 7.1	+ 4.2	+ 1.6	+ 0.8	+ 0.5	+ 0.2	+ 0.1	+ 2.1	+ 4.1	+ 2.0
11th	+ 3.5	+ 3.8	+ 4.0	+ 2.6	+ 2.8	+ 2.9	+ 3.4	+ 5.2	+ 4.2	+ 5.1	+ 5.1	+ 3.5	+ 15.9	+ 11.0	+ 7.0	+ 5.2	+ 4.0	+ 1.1	+ 2.4	+ 3.5	+ 3.0	+ 3.5	+ 3.2	+ 3.1
12th	+ 3.2	+ 2.0	+ 2.9	+ 3.1	+ 3.9	+ 3.8	+ 5.4	+ 5.8	+ 6.6	+ 4.7	+ 3.3	+ 2.6	+ 0.5	+ 1.2	+ 1.2	+ 0.2	+ 1.7	+ 2.7	+ 4.0	+ 4.9	+ 4.7	+ 4.7	+ 4.4	+ 4.0
13th	+ 3.9	+ 4.2	+ 5.0	+ 4.7	+ 5.0	+ 5.9	+ 6.7	+ 8.3	+ 8.0	+ 6.8	+ 5.9	+ 3.9	+ 2.7	+ 2.6	+ 1.1	+ 3.2	+ 3.6	+ 3.8	+ 4.6	+ 5.1	+ 5.1	+ 5.1	+ 5.2	+ 5.5
14th	+ 9.2	+ 5.3	+ 6.2	+ 5.5	+ 4.9	+ 7.3	+ 7.9	—	+ 9.0	+ 9.3	+ 6.7	+ 4.8	+ 5.3	+ 5.8	+ 4.2	+ 3.6	+ 2.7	+ 6.1	+ 6.9	+ 7.3	+ 7.9	+ 8.1	+ 7.4	+ 6.6
15th	+ 6.4	+ 6.8	+ 6.5	+ 7.2	+ 8.3	+ 8.9	+ 8.5	+ 9.5	+ 8.0	+ 6.3	+ 3.0	+ 1.1	+ 0.6	+ 0.3	+ 1.2	+ 3.5	+ 5.5	+ 8.3	+ 8.2	+ 8.0	+ 5.2	+ 5.2	+ 7.0	+ 6.8
16th	+ 6.9	+ 6.2	+ 6.6	+ 7.2	+ 6.3	+ 7.2	+ 8.8	+ 8.1	+ 11.6	+ 10.3	+ 4.6	+ 0.9	+ 3.9	+ 8.3	+ 13.3	+ 11.7	+ 8.8	+ 11.9	+ 14.0	+ 14.5	+ 18.6	+ 28.7	+ 13.3	+ 19.1
17th	+ 7.8	+ 7.4	+ 9.5	+ 10.2	+ 8.8	+ 6.8	+ 6.5	+ 1.4	+ 0.7	+ 4.1	+ 4.3	+ 7.2	+ 7.1	+ 7.8	+ 5.9	+ 0.9	+ 1.4	+ 1.9	+ 0.1	+ 1.5	+ 7.7	+ 2.8	+ 3.9	+ 2.8
18th	+ 2.8	+ 2.7	+ 3.8	+ 4.2	+ 6.7	+ 9.7	+ 5.9	+ 5.8	+ 5.9	+ 4.3	+ 1.4	+ 3.2	+ 4.9	+ 6.1	+ 4.7	+ 3.0	+ 0.2	+ 1.6	+ 1.8	+ 3.7	+ 3.7	+ 4.6	+ 4.4	+ 4.1
19th	+ 4.9	+ 4.3	+ 4.6	+ 4.7	+ 5.5	+ 6.4	+ 6.3	+ 8.1	+ 5.9	+ 4.6	+ 0.4	+ 2.9	+ 2.7	+ 2.3	+ 1.7	+ 1.2	+ 2.4	+ 4.2	+ 0.0	+ 4.8	+ 3.5	+ 1.1	+ 4.1	+ 5.1
20th	+ 5.5	+ 5.5	+ 4.8	+ 6.1	+ 6.6	+ 8.4	+ 8.2	+ 5.2	+ 3.7	+ 3.5	+ 0.4	+ 8.1	+ 6.9	+ 9.3	+ 3.9	+ 4.4	+ 2.6	+ 0.5	+ 0.5	+ 1.6	+ 1.1	+ 2.5	+ 0.3	+ 1.8
21st	+ 1.3	+ 6.5	+ 2.0	+ 3.0	+ 4.3	+ 1.5	+ 3.9	+ 2.5	+ 1.2	+ 0.2	+ 0.3	+ 2.7	+ 2.7	+ 1.4	+ 0.2	+ 3.0	+ 3.4	+ 3.2	+ 1.9	+ 0.3	+ 1.4	+ 8.7	+ 4.9	+ 4.0
22d	+ 3.6	+ 6.0	+ 5.3	+ 4.8	+ 5.3	+ 6.2	+ 6.6	+ 6.7	+ 4.9	+ 2.1	+ 1.7	+ 3.5	+ 5.0	+ 0.5	+ 3.3	+ 5.6	+ 5.9	+ 5.9	+ 4.8	+ 3.8	+ 1.9	—	+ 5.5	+ 6.0
23d	+ 6.4	+ 7.0	+ 5.8	+ 4.1	+ 6.5	+ 6.5	+ 6.6	+ 5.1	+ 4.5	+ 2.9	+ 1.3	+ 1.3	+ 1.9	+ 2.0	+ 0.2	+ 3.4	+ 3.8	+ 5.1	+ 5.8	+ 5.7	+ 5.9	+ 6.3	+ 6.6	+ 6.2
24th	+ 6.9	+ 6.3	+ 7.0	+ 7.2	+ 7.6	+ 7.8	+ 7.9	+ 8.2	+ 6.4	+ 3.5	+ 0.5	+ 2.1	+ 1.7	+ 0.3	+ 2.3	+ 3.4	+ 4.6	+ 4.9	+ 5.6	+ 6.4	+ 6.6	+ 6.6	+ 6.0	+ 6.6
25th	+ 4.6	+ 6.8	+ 6.9	+ 6.6	+ 6.7	+ 7.1	+ 6.5	+ 6.8	+ 5.9	+ 3.0	+ 0.3	+ 2.7	+ 4.4	+ 6.5	+ 5.0	+ 0.2	+ 2.9	+ 3.9	+ 1.1	+ 6.0	+ 5.5	+ 6.4	+ 6.3	+ 6.5
26th	+ 6.5	+ 6.2	+ 6.1	+ 13.3	+ 13.3	+ 14.0	+ 17.4	+ 11.7	+ 10.6	+ 0.7	+ 0.2	+ 0.7	+ 1.4	+ 1.9	+ 1.1	+ 2.6	+ 10.1	+ 10.5	+ 0.9	+ 2.2	+ 0.7	+ 0.3	+ 1.6	+ 4.8
27th	+ 1.3	+ 6.1	+ 7.1	+ 6.5	+ 1.1	+ 5.9	+ 8.4	+ 7.4	+ 0.1	+ 0.1	+ 0.0	+ 5.3	+ 5.7	+ 2.3	+ 1.1	+ 1.6	+ 1.5	+ 1.4	+ 0.6	+ 4.1	+ 4.7	+ 5.0	+ 5.3	+ 5.2
28th	+ 5.2	+ 2.1	+ 0.7	+ 5.1	+ 5.6	+ 6.1	+ 7.4	+ 7.4	+ 6.0	+ 5.0	+ 1.7	+ 1.4	+ 2.4	+ 3.7	+ 1.5	+ 1.9	+ 3.5	+ 5.5	+ 7.0	+ 6.6	+ 7.4	+ 7.4	+ 7.3	+ 7.1
29th	+ 5.9	+ 9.3	+ 9.5	+ 10.5	+ 9.9	+ 10.4	+ 9.9	+ 12.2	+ 11.0	+ 7.4	+ 2.9	+ 1.0	+ 0.1	+ 2.1	+ 5.3	+ 5.3	+ 6.6	+ 7.6	+ 6.8	+ 7.0	+ 6.9	+ 7.4	+ 7.1	—
30th	+ 6.9	+ 6.0	+ 5.7	+ 6.7	+ 7.4	+ 7.0	+ 8.1	+ 7.7	+ 5.3	+ 1.2	+ 1.8	+ 2.7	+ 3.0	+ 0.4	+ 5.0	+ 7.7	+ 7.8	+ 1.7	+ 6.7	+ 7.6	+ 8.1	+ 7.6	+ 7.1	+ 8.5
Means	+ 3.89	+ 4.59	+ 3.58	+ 4.24	+ 4.26	+ 5.29	+ 5.67	+ 4.66	+ 4.45	+ 3.10	+ 0.68	+ 2.23	+ 3.54	+ 3.40	+ 2.83	+ 0.50	+ 0.14	+ 0.99	+ 0.65	+ 1.71	+ 2.98	+ 2.43	+ 4.29	+ 2.73
Normals	+ 4.85	+ 5.02	+ 5.06	+ 5.48	+ 5.57	+ 6.07	+ 6.46	+ 6.28	+ 5.64	+ 3.80	+ 1.49	+ 1.63	+ 2.10	+ 2.51	+ 0.56	+ 0.82	+ 1.99	+ 3.20	+ 3.34	+ 4.37	+ 4.17	+ 4.63	+ 4.90	+ 4.55

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF OCTOBER 1860.

Value of a part of division = 0.0001,49.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 7.1	+ 7.6	+ 7.8	+ 8.0	+ 8.7	+ 8.7	+ 9.3	+ 9.3	+ 6.9	+ 3.6	+ 0.1	+ 3.1	+ 2.9	+ 0.5	+ 3.3	+ 4.6	+ 10.6	+ 8.2	+ 9.4	+ 13.0	+ 6.1	+ 4.3	+ 5.0	+ 7.5
2d	+ 4.8	+ 3.0	+ 1.8	+ 0.2	+ 2.2	+ 3.3	+ 8.7	+ 3.8	+ 2.6	+ 0.8	+ 7.9	+ 12.8	+ 8.9	+ 5.0	+ 1.8	+ 1.0	+ 2.1	+ 0.2	+ 9.0	+ 1.9	+ 3.4	+ 0.2	+ 1.3	+ 6.7
3d	+ 1.0	+ 0.8	+ 1.8	+ 3.9	+ 3.0	+ 2.5	+ 1.7	+ 1.6	+ 0.1	+ 3.6	+ 5.8	+ 6.7	+ 5.2	+ 4.3	+ 0.4	+ 3.4	+ 0.7	+ 0.6	+ 1.4	+ 0.5	+ 1.7	+ 3.4	+ 0.2	+ 1.9
4th	+ 12.4	+ 11.8	+ 4.7	+ 5.9	+ 5.5	+ 8.2	+ 3.3	+ 2.7	+ 2.2	+ 2.9	+ 6.0	+ 7.8	+ 10.7	+ 7.2	+ 2.4	+ 1.8	+ 0.3	+ 2.1	+ 4.7	+ 5.7	+ 6.7	+ 6.0	+ 0.2	+ 6.4
5th	+ 5.2	+ 2.2	+ 1.3	+ 2.0	+ 0.3	+ 1.3	+ 0.6	+ 2.0	+ 4.1	+ 7.3	+ 9.0	+ 10.5	+ 9.8	+ 4.6	+ 1.4	+ 3.3	+ 6.2	+ 7.9	+ 4.4	+ 1.4	+ 3.9	+ 2.8	+ 4.2	+ 3.8
6th	+ 1.8	+ 6.3	+ 3.8	+ 2.5	+ 2.4		+ 0.7	+ 0.6	+ 0.3	+ 0.7	+ 2.2	+ 3.7	+ 4.5	+ 2.9	+ 1.8	+ 0.3	+ 0.1	+ 0.5	+ 0.4	+ 0.4	+ 1.2	+ 0.7	+ 0.5	+ 0.7
7th	+ 0.2	+ 0.1	+ 0.5	+ 0.9	+ 0.8	+ 1.5	+ 1.8	+ 1.6	+ 0.3	+ 1.2	+ 1.8	+ 2.3	+ 1.2	+ 0.3	+ 0.4	+ 2.9	+ 3.1	+ 3.1	+ 0.9	+ 2.9	+ 3.6	+ 3.1	+ 2.4	+ 3.5
8th	+ 2.9	+ 2.8	+ 2.5		+ 3.2	+ 3.6	+ 4.0	+ 4.8	+ 2.3	+ 0.3	+ 3.3	+ 4.5	+ 3.4	+ 1.8	+ 0.7	+ 3.1	+ 4.7	+ 2.2	+ 1.7	+ 2.5	+ 2.4	+ 3.2	+ 3.7	+ 2.9
9th	+ 3.6	+ 3.6	+ 3.6	+ 5.8	+ 5.6	+ 5.8	+ 6.9	+ 6.6	+ 4.4	+ 0.9	+ 5.6	+ 8.6	+ 9.9	+ 3.4	+ 4.8	+ 0.9	+ 1.8	+ 0.9	+ 0.6	+ 5.0	+ 1.2	+ 3.4	+ 4.1	+ 3.7
10th	+ 3.4	+ 2.4	+ 3.3	+ 7.2	+ 13.5	+ 3.8	+ 4.6	+ 2.9	+ 2.1	+ 0.7	+ 1.7	+ 3.6	+ 4.7	+ 5.0	+ 2.8	+ 1.1	+ 2.0	+ 2.7	+ 2.0	+ 1.6	+ 3.6	+ 3.8	+ 2.6	+ 6.1
11th	+ 2.6	+ 2.7	+ 2.9	+ 4.5	+ 3.7	+ 3.7	+ 1.3	+ 1.9	+ 1.0	+ 1.2	+ 4.2	+ 5.7	+ 4.2	+ 2.1	+ 0.4	+ 2.2	+ 3.1	+ 3.3	+ 2.3	+ 3.8	+ 3.0	+ 4.1	+ 3.9	+ 3.6
12th	+ 3.0	+ 3.2	+ 3.4	+ 3.6	+ 4.5	+ 5.1	+ 6.1	+ 2.7	+ 1.3	+ 2.0	+ 4.7	+ 6.4	+ 6.6	+ 2.6	+ 0.3	+ 0.7	+ 2.4	+ 2.9	+ 1.9	+ 1.3	+ 3.3	+ 2.6	+ 0.8	+ 3.0
13th	+ 3.0	+ 3.1	+ 2.9	+ 3.1	+ 4.1	+ 3.9	+ 4.8	+ 2.3	+ 1.8	+ 2.0	+ 5.1	+ 5.2	+ 3.3	+ 2.5	+ 0.0	+ 1.1	+ 1.4	+ 1.7	+ 2.1	+ 3.0	+ 3.6	+ 1.2	+ 1.1	+ 1.9
14th	+ 0.8	+ 2.6	+ 2.7	+ 3.2	+ 2.7	+ 3.1	+ 4.6	+ 3.6	+ 2.3	+ 0.4	+ 2.8	+ 4.5	+ 2.1	+ 0.2	+ 1.8	+ 2.4	+ 0.6	+ 2.4	+ 3.1	+ 4.5	+ 3.6	+ 3.6	+ 2.9	+ 3.5
15th	+ 4.4	+ 4.9	+ 3.4	+ 5.4	+ 5.9	+ 6.1	+ 6.2		+ 5.0	+ 2.5	+ 7.0	+ 5.8	+ 5.6	+ 1.7	+ 0.5	+ 3.8	+ 5.9	+ 3.8	+ 3.1	+ 4.1	+ 5.1	+ 4.5	+ 4.8	+ 5.1
16th		+ 5.1	+ 4.7	+ 6.3	+ 6.3	+ 8.7	+ 7.5	+ 6.2	+ 3.2	+ 1.1	+ 7.1	+ 9.1	+ 8.1	+ 5.1	+ 1.2	+ 5.1	+ 4.0	+ 4.7	+ 3.9	+ 5.6	+ 4.6	+ 5.2	+ 5.9	+ 7.4
17th	+ 5.9	+ 5.6	+ 6.4	+ 7.0	+ 7.6	+ 7.7	+ 8.5	+ 7.2	+ 5.2	+ 4.2	+ 4.4	+ 9.7	+ 5.4	+ 3.0	+ 2.8	+ 2.1	+ 3.4	+ 1.6	+ 0.0	+ 2.4	+ 3.3	+ 3.0	+ 2.7	+ 1.4
18th	+ 0.9	+ 0.3	+ 1.2	+ 0.1	+ 0.6	+ 0.7	+ 1.0	+ 1.3	+ 1.7	+ 1.2	+ 6.0	+ 11.1	+ 11.9	+ 10.3	+ 5.5	+ 1.7	+ 0.0	+ 1.4	+ 2.2	+ 0.9	+ 1.9	+ 1.9	+ 1.8	+ 2.5
19th	+ 1.8	+ 1.4	+ 1.8	+ 2.3	+ 3.3	+ 4.6	+ 4.5	+ 5.4	+ 4.8								+ 1.4	+ 4.5	+ 4.2	+ 6.3	+ 3.8	+ 3.6	+ 3.9	+ 3.8
20th	+ 4.0	+ 3.7	+ 3.8	+ 4.9	+ 4.7	+ 5.7	+ 6.3	+ 6.6	+ 6.1	+ 3.4	+ 0.6	+ 9.9	+ 0.7	+ 2.2	+ 3.1	+ 3.8	+ 4.5	+ 5.4	+ 5.5	+ 6.4	+ 6.7	+ 6.6	+ 6.3	+ 4.7
21st		+ 4.8	+ 5.1	+ 4.2	+ 5.3	+ 5.7	+ 6.3	+ 5.0	+ 6.2	+ 5.3	+ 2.6	+ 1.2	+ 0.6	+ 0.7	+ 3.4	+ 0.7	+ 3.3	+ 1.7	+ 2.9	+ 3.4	+ 3.2	+ 3.3	+ 3.5	+ 3.5
22d	+ 3.5	+ 2.7	+ 3.7	+ 4.3	+ 3.0	+ 3.5	+ 4.3	+ 4.5	+ 3.5	+ 1.6	+ 1.0	+ 1.5	+ 0.1	+ 2.2	+ 4.1	+ 4.3	+ 4.6	+ 3.6	+ 3.6	+ 3.3	+ 3.2	+ 3.9	+ 3.0	+ 3.1
23d	+ 3.2	+ 2.9	+ 2.6	+ 2.6	+ 3.0	+ 3.2	+ 4.5	+ 3.5	+ 2.7	+ 1.1	+ 0.2	+ 0.2	+ 1.8	+ 2.5	+ 2.1	+ 3.1	+ 3.9	+ 3.8	+ 4.1	+ 4.0	+ 4.0	+ 4.0	+ 2.5	+ 3.3
24th	+ 2.7	+ 3.7	+ 3.7	+ 4.5	+ 4.6	+ 5.1	+ 5.7	+ 5.3	+ 2.9	+ 0.8	+ 3.6	+ 4.0	+ 2.1	+ 0.7	+ 3.6	+ 5.5	+ 6.4	+ 5.1	+ 4.6	+ 5.0	+ 6.2	+ 5.5	+ 5.7	+ 4.9
25th		+ 5.0	+ 5.2	+ 5.2	+ 5.7	+ 5.7	+ 5.7	+ 5.0	+ 3.9	+ 2.2	+ 0.7	+ 0.2	+ 2.1	+ 5.8	+ 5.9	+ 6.1	+ 5.4	+ 5.0	+ 4.8	+ 5.1	+ 4.6	+ 4.7	+ 4.7	+ 4.7
26th	+ 4.6	+ 4.3	+ 4.4	+ 6.4	+ 5.1	+ 4.6	+ 6.0	+ 6.1	+ 4.6	+ 0.7	+ 2.9	+ 5.1	+ 4.7	+ 1.6	+ 1.7	+ 3.6	+ 3.8	+ 3.7	+ 1.7	+ 1.3	+ 2.9	+ 1.6	+ 2.1	+ 3.1
27th	+ 1.6	+ 2.5	+ 2.0	+ 3.1	+ 4.7	+ 4.5	+ 5.6	+ 5.7	+ 2.9	+ 1.5	+ 5.4	+ 5.5	+ 3.0	+ 1.7	+ 0.1	+ 2.2	+ 2.1	+ 2.1	+ 0.9	+ 2.5	+ 1.6	+ 1.0	+ 1.5	+ 7.2
28th	+ 0.5	+ 0.7	+ 1.1	+ 1.4	+ 0.6	+ 0.6	+ 3.4	+ 1.0	+ 1.1	+ 5.1	+ 8.0	+ 9.1	+ 8.9	+ 8.0	+ 5.5	+ 3.5	+ 2.0	+ 2.2		+ 3.3	+ 1.1	+ 0.1	+ 0.1	+ 0.4
29th	+ 0.6	+ 0.7	+ 0.1	+ 0.9	+ 0.4	+ 2.1	+ 1.8	+ 1.5	+ 0.7	+ 1.2	+ 3.5	+ 4.4	+ 2.9	+ 1.4	+ 0.2	+ 1.7	+ 1.9	+ 2.5	+ 2.1	+ 2.6	+ 2.7	+ 2.0	+ 4.1	+ 2.1
30th	+ 4.3	+ 2.8	+ 1.1	+ 3.4	+ 7.3	+ 1.7	+ 3.2	+ 1.7	+ 4.1	+ 6.1	+ 8.4	+ 8.9	+ 7.1	+ 8.7	+ 2.8	+ 1.1	+ 0.9	+ 1.4	+ 0.8	+ 0.8	+ 2.5	+ 2.8	+ 4.0	+ 0.9
31st	+ 6.9	+ 2.6	+ 1.3	+ 2.0	+ 0.6	+ 1.0	+ 0.9	+ 0.3	+ 11.6	+ 2.8	+ 4.1	+ 8.0	+ 6.3	+ 2.8	+ 2.7	+ 0.6	+ 0.2	+ 3.6	+ 0.1	+ 0.9	+ 1.4	+ 0.2	+ 1.0	+ 9.1
Means	+ 1.75	+ 1.87	+ 2.26	+ 2.99	+ 3.55	+ 3.44	+ 3.81	+ 3.33	+ 2.54	+ 1.01	+ 3.91	+ 5.20	+ 4.60	+ 2.41	+ 0.24	+ 1.77	+ 1.75	+ 1.72	+ 2.02	+ 2.14	+ 1.89	+ 1.84	+ 2.08	+ 2.10
Normals	+ 2.28	+ 2.62	+ 2.26	+ 3.29	+ 3.52	+ 3.84	+ 3.81	+ 3.33	+ 2.24	+ 1.01	+ 3.91	+ 5.72	+ 4.60	+ 2.69	+ 0.24	+ 1.77	+ 1.71	+ 2.04	+ 2.02	+ 1.78	+ 2.17	+ 1.84	+ 2.08	+ 3.08

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF NOVEMBER 1960.

Value of a part of division = 0.0001,93.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.7	+ 3.2	+ 0.1	- 1.3	+ 1.1	+ 1.2	+ 1.4	+ 2.5	+ 1.8	+ 0.7	- 2.5	- 5.4	- 5.2	- 4.0	- 1.9	- 0.4	+ 1.2	+ 1.9	+ 1.9	+ 1.7	+ 1.9	+ 2.0	+ 1.8	+ 2.0
2d	+ 1.6	+ 2.0	+ 1.6	+ 2.0	+ 2.2	+ 4.1	+ 6.1	+ 4.6	+ 3.5	- 1.5	- 3.3	- 4.7	- 4.9	- 3.7	- 2.6	- 0.5	+ 0.1	- 1.2	0.0	+ 0.5	- 1.4	+ 1.3	+ 1.6	+ 1.3
3d	+ 1.9	+ 0.9	+ 1.0	+ 2.7	+ 2.8	+ 4.6	+ 1.3	- 0.6	- 3.2	- 4.3	- 5.4	- 5.5	- 8.7	- 3.3	- 2.4	-	- 0.3	- 0.6	- 2.7	- 0.9	- 1.1	- 1.4	- 0.7	+ 1.5
4th	- 2.2	- 1.1	- 0.4	+ 0.4	+ 1.4	+ 0.2	+ 1.5	+ 1.6	+ 0.7	- 1.0	- 2.3	- 3.4	- 2.1	- 1.5	- 0.2	+ 1.3	+ 2.5	+ 2.4	+ 1.6	+ 3.9	+ 2.1	+ 1.9	+ 2.8	+ 2.9
5th	+ 2.2	+ 2.1	+ 2.1	+ 2.6	+ 3.7	+ 3.0	+ 3.7	+ 3.3	+ 1.2	- 2.1	- 8.0	- 12.7	- 8.8	- 9.6	- 15.1	- 4.3	- 2.0	+ 0.1	- 3.2	+ 0.8	+ 0.2	- 0.5	+ 1.8	+ 0.9
6th	+ 3.3	+ 1.2	+ 1.0	+ 0.4	+ 0.3	+ 0.6	+ 0.8	+ 0.9	- 1.8	- 2.4	- 2.8	- 3.8	- 2.6	- 0.5	- 0.1	+ 3.9	+ 1.7	+ 2.0	+ 1.7	+ 1.5	+ 4.4	+ 3.9	+ 2.7	+ 2.7
7th	+ 3.1	+ 2.6	+ 3.4	+ 2.7	+ 2.2	+ 1.9	+ 3.4	+ 2.9	+ 1.5	+ 0.2	- 4.0	- 4.3	- 3.2	- 0.9	+ 0.8	+ 4.2	+ 5.8	+ 3.4	+ 2.5	+ 2.6	+ 2.5	+ 2.4	+ 3.3	+ 3.2
8th	+ 2.4	+ 3.0	+ 5.7	+ 4.3	+ 4.8	+ 4.5	+ 4.4	+ 3.8	+ 1.1	+ 3.8	- 7.1	- 4.5	- 1.7	+ 1.0	+ 1.2	+ 2.0	+ 1.3	+ 1.4	+ 1.0	- 0.4	+ 1.1	+ 1.2	+ 1.6	+ 1.8
9th	+ 2.4	+ 2.5	+ 2.6	+ 2.7	+ 3.4	+ 3.9	+ 4.5	+ 3.9	+ 1.9	+ 1.4	+ 0.5	+ 0.3	+ 1.6	+ 2.3	+ 1.6	+ 0.9	- 0.2	+ 1.4	+ 0.9	- 0.4	+ 0.4	+ 0.5	+ 0.5	+ 1.5
10th	+ 3.7	+ 3.7	+ 1.4	+ 2.1	+ 2.9	+ 3.5	+ 2.8	+ 2.0	+ 0.3	- 0.8	- 3.4	- 4.6	- 3.7	- 1.5	-	+ 2.8	+ 2.9	+ 3.1	+ 2.8	+ 3.3	+ 1.5	+ 2.2	+ 2.4	+ 2.7
11th	+ 2.5	+ 2.7	+ 3.1	+ 3.5	+ 3.3	+ 3.9	+ 4.0	+ 2.8	+ 1.5	- 0.2	- 1.3	- 2.8	- 1.1	+ 0.1	+ 2.2	+ 4.5	+ 4.3	+ 3.6	+ 4.2	+ 4.3	+ 4.1	+ 3.4	+ 4.8	+ 6.1
12th	+ 5.5	+ 5.7	+ 5.6	+ 5.3	+ 5.0	-	-	+ 2.4	+ 1.2	- 0.6	- 3.0	- 2.8	- 2.1	+ 1.9	+ 3.5	+ 4.7	+ 4.8	+ 3.2	+ 2.2	+ 3.4	+ 4.2	+ 4.9	+ 3.1	+ 3.3
13th	+ 3.9	+ 4.0	+ 4.4	+ 4.8	+ 5.2	+ 5.9	+ 5.5	+ 0.2	+ 1.2	+ 0.5	- 2.5	- 2.9	+ 0.2	+ 2.0	+ 4.1	+ 6.3	+ 7.6	+ 6.6	+ 5.0	+ 4.5	+ 4.1	+ 4.8	+ 4.1	+ 3.4
14th	+ 3.4	+ 3.1	+ 3.4	+ 3.4	+ 4.3	+ 5.4	+ 6.4	+ 6.5	+ 5.3	+ 2.8	+ 0.3	- 2.6	- 3.2	- 1.9	+ 2.7	+ 5.1	+ 7.0	+ 6.6	+ 4.9	+ 4.3	+ 4.6	+ 6.1	+ 4.8	+ 4.4
15th	+ 4.3	+ 4.0	+ 3.5	+ 4.7	+ 5.3	+ 5.0	+ 5.0	+ 5.0	+ 3.4	+ 1.8	- 0.2	- 1.0	- 0.2	+ 0.5	+ 2.6	+ 4.0	+ 3.7	+ 5.4	+ 3.8	+ 3.1	+ 1.8	+ 2.2	+ 2.9	+ 5.2
16th	+ 1.6	+ 1.7	+ 3.5	+ 3.8	+ 3.7	+ 0.4	+ 5.1	+ 4.3	- 0.5	- 3.8	- 4.8	- 3.7	+ 0.1	- 0.1	+ 2.9	+ 0.3	+ 1.3	+ 4.6	- 2.4	+ 1.6	+ 0.7	- 0.3	+ 1.0	+ 0.1
17th	+ 0.4	+ 0.7	+ 2.1	+ 1.3	+ 1.9	+ 3.4	+ 3.5	-	+ 1.0	+ 0.1	- 1.5	- 0.5	+ 2.6	+ 3.8	+ 5.0	+ 4.6	-	+ 2.7	+ 2.2	- 3.0	+ 1.9	+ 1.9	+ 7.4	+ 2.3
18th	+ 2.1	+ 2.7	+ 2.2	+ 2.6	+ 2.9	+ 4.4	+ 5.0	+ 5.8	+ 3.0	+ 0.9	- 1.4	+ 2.0	+ 3.3	+ 5.6	+ 6.1	+ 5.5	+ 6.9	+ 4.1	-	+ 6.4	+ 0.1	+ 1.4	+ 2.8	+ 2.1
19th	+ 6.3	+ 1.6	+ 1.3	+ 1.4	+ 3.6	+ 3.3	+ 3.7	+ 3.4	-	+ 0.7	- 0.8	+ 0.2	+ 2.6	+ 2.8	+ 6.4	+ 6.0	+ 6.2	+ 4.3	+ 3.3	+ 3.0	+ 3.0	+ 2.7	+ 3.8	+ 4.6
20th	+ 4.2	+ 4.6	+ 4.0	+ 5.5	+ 4.7	+ 5.4	+ 5.4	+ 4.7	+ 3.5	+ 2.9	+ 1.5	- 2.1	- 1.8	+ 0.7	+ 1.9	+ 3.1	+ 4.1	+ 2.8	+ 1.1	+ 2.1	+ 2.8	+ 3.0	+ 3.0	+ 2.6
21st	+ 2.9	+ 3.0	+ 3.8	+ 3.8	+ 3.5	+ 4.4	+ 6.3	+ 5.1	+ 2.1	+ 0.8	- 1.6	- 2.1	- 0.4	+ 1.1	+ 2.0	+ 3.2	+ 3.1	+ 4.0	+ 2.8	+ 2.8	+ 3.2	+ 3.2	+ 3.0	+ 3.0
22d	+ 2.7	+ 2.7	+ 3.1	+ 3.5	+ 4.1	+ 4.3	+ 4.4	+ 3.6	+ 0.7	- 1.6	- 3.6	- 4.6	- 2.6	- 1.3	+ 2.2	+ 4.5	+ 5.5	+ 3.9	+ 3.3	+ 3.0	+ 2.6	+ 3.2	+ 3.1	+ 3.8
23d	+ 2.9	+ 2.2	+ 2.2	+ 3.0	+ 3.7	+ 4.4	+ 5.2	+ 5.1	+ 3.8	+ 3.0	+ 1.2	+ 5.0	+ 1.5	+ 4.9	+ 7.2	+ 9.7	+ 9.2	+ 7.8	+ 3.3	-	-	-	-	-
24th	-	-	-	-	-	-	- 0.4	- 1.8	- 1.4	- 1.8	- 3.6	- 0.4	- 4.2	- 2.7	- 2.2	+ 1.1	+ 1.3	+ 1.1	+ 1.3	+ 0.9	+ 1.4	+ 4.3	+ 5.1	+ 2.6
25th	+ 2.5	+ 2.6	+ 1.8	+ 3.8	+ 4.0	+ 3.3	+ 3.2	+ 2.3	+ 0.6	- 1.0	- 2.4	- 4.5	- 4.3	- 2.0	+ 1.9	+ 3.9	+ 4.7	+ 5.8	+ 4.4	+ 4.6	+ 4.1	+ 4.4	+ 4.0	+ 5.1
26th	+ 5.1	+ 6.2	+ 5.3	+ 4.1	+ 6.7	+ 4.7	+ 4.7	-	- 0.1	- 1.7	- 2.1	- 1.7	- 0.8	+ 1.7	+ 3.6	+ 5.4	+ 6.9	+ 5.8	+ 3.8	+ 3.3	+ 3.8	+ 4.8	+ 2.7	+ 0.2
27th	+ 6.1	- 1.7	+ 0.9	+ 2.1	+ 3.3	+ 3.4	+ 3.9	+ 4.4	+ 3.1	+ 8.4	- 2.6	- 1.3	- 0.3	- 1.2	+ 6.0	+ 6.3	+ 4.7	+ 4.0	+ 3.3	+ 2.9	+ 2.6	+ 6.1	+ 2.6	+ 1.9
28th	+ 4.7	+ 6.4	+ 2.7	+ 2.6	+ 3.7	+ 5.1	+ 4.6	+ 3.3	-	- 2.6	- 3.8	- 3.0	- 2.4	0.0	+ 3.8	+ 5.7	+ 4.5	+ 4.4	+ 3.2	0.0	+ 2.5	+ 3.4	+ 4.3	+ 3.6
29th	+ 2.1	+ 2.2	+ 3.5	+ 2.1	+ 3.0	+ 3.5	+ 3.0	+ 2.4	+ 1.5	+ 0.1	+ 0.5	- 0.1	- 0.8	+ 1.8	+ 5.0	+ 5.7	+ 5.0	+ 3.1	+ 3.3	+ 3.9	+ 4.8	+ 3.9	+ 4.6	+ 6.4
30th	+ 4.0	+ 3.2	+ 2.8	+ 3.9	+ 1.0	+ 2.0	+ 2.6	+ 2.2	- 1.9	- 4.6	- 5.2	- 6.0	- 2.9	+ 2.7	+ 5.0	+ 3.7	+ 4.7	+ 3.4	+ 3.6	+ 0.8	+ 2.9	+ 2.1	+ 1.7	+ 0.4
Means	+ 3.08	+ 2.68	+ 2.68	+ 2.89	+ 3.37	+ 3.56	+ 3.83	+ 3.09	+ 1.25	- 0.06	- 2.51	- 2.78	- 1.87	- 0.06	+ 1.83	+ 3.56	+ 3.74	+ 3.37	+ 2.18	+ 1.80	+ 2.24	+ 2.72	+ 2.99	+ 2.81
Normals	+ 3.08	+ 2.68	+ 2.68	+ 2.89	+ 3.37	+ 3.56	+ 3.83	+ 3.09	+ 1.25	- 0.36	- 2.51	- 2.71	- 1.87	+ 0.27	+ 2.44	+ 3.84	+ 3.74	+ 3.37	+ 2.18	+ 2.09	+ 2.24	+ 2.72	+ 2.99	+ 2.81

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF DECEMBER 1960.

Value of a part of division = 0.0001,93.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.6	+ 5.1	+ 1.4	+ 1.9	+ 1.4	+ 3.3	+ 3.4	—	—	— 0.1	— 0.8	— 1.5	— 1.2	+ 0.2	+ 1.1	+ 4.5	+ 6.9	+ 5.7	+ 4.7	+ 4.2	+ 4.5	+ 5.2	+ 3.5	+ 5.7
2d	+ 3.6	— 3.1	+ 3.3	+ 4.3	+ 5.1	+ 6.7	+ 6.2	+ 6.3	+ 1.4	— 0.2	+ 7.3	— 2.3	— 0.7	+ 3.3	+ 5.1	+ 8.7	+ 8.1	+ 6.9	—	+ 4.9	+ 5.3	+ 5.5	+ 5.3	+ 6.1
3d	+ 4.5	+ 4.9	+ 4.6	+ 5.2	+ 5.2	+ 5.3	+ 6.0	+ 4.2	+ 3.4	— 0.3	— 2.9	— 3.4	— 0.9	+ 4.1	+ 7.7	+ 8.0	+ 6.8	+ 5.2	—	+ 6.2	+ 6.6	+ 5.9	+ 5.7	+ 5.7
4th	+ 5.4	+ 5.2	+ 6.5	+ 8.1	+ 6.4	+ 4.6	+ 7.7	+ 8.2	+ 7.8	+ 6.9	+ 4.5	+ 4.4	+ 5.3	+ 7.4	+ 8.2	+ 9.5	+ 6.0	+ 4.4	+ 4.5	+ 4.5	+ 4.8	+ 4.7	+ 4.7	+ 4.4
5th	+ 4.4	+ 4.4	+ 4.6	+ 5.2	+ 5.4	+ 5.8	+ 5.1	+ 4.5	+ 2.9	+ 0.8	— 1.0	— 0.7	+ 0.3	+ 2.9	+ 5.5	+ 5.8	+ 5.8	+ 4.0	+ 4.9	+ 4.5	+ 3.8	+ 4.7	+ 4.8	—
6th	+ 4.7	+ 4.9	+ 4.9	+ 5.5	+ 4.5	+ 4.8	+ 5.6	+ 5.5	+ 3.2	+ 3.0	+ 1.6	+ 4.4	+ 4.9	+ 6.2	+ 5.6	+ 6.4	+ 5.5	+ 5.3	+ 4.9	+ 5.4	+ 5.6	+ 5.6	+ 5.3	+ 2.8
7th	+ 4.4	+ 3.9	+ 4.3	+ 4.3	+ 4.7	+ 5.6	+ 6.0	+ 5.4	+ 4.9	+ 4.4	+ 3.1	+ 3.1	+ 4.1	+ 4.7	+ 7.1	+ 7.2	+ 7.8	+ 7.1	+ 5.7	+ 4.9	+ 5.8	+ 5.4	+ 5.4	+ 5.1
8th	+ 4.9	+ 5.0	+ 4.6	+ 4.1	+ 5.6	+ 6.0	+ 6.1	+ 5.4	+ 2.3	+ 1.7	+ 3.3	+ 3.8	+ 5.7	+ 6.4	+ 7.9	+ 8.7	+ 6.8	+ 5.8	+ 5.6	+ 5.7	+ 5.5	+ 5.4	+ 5.3	+ 5.1
9th	+ 5.1	+ 5.1	+ 5.1	+ 5.0	+ 5.4	+ 5.1	+ 3.7	+ 3.7	—	+ 1.7	+ 1.0	+ 2.6	+ 5.4	+ 9.7	+ 7.3	+ 7.8	+ 7.6	+ 6.2	+ 4.9	+ 2.7	+ 3.7	+ 2.9	+ 4.7	+ 2.3
10th	+ 4.3	— 1.7	— 2.3	— 1.3	+ 2.7	+ 0.8	+ 1.5	— 0.1	—	— 4.9	— 4.7	— 3.0	+ 0.6	+ 4.2	+ 6.0	+ 11.7	+ 4.6	+ 4.8	+ 4.3	—	—	—	—	—
11th	—	—	—	—	—	— 5.9	— 5.2	— 4.7	— 11.1	— 5.8	— 19.1	— 13.8	— 10.4	— 5.6	— 1.2	— 8.6	— 3.4	— 7.6	— 3.7	— 12.0	— 12.4	— 12.3	— 9.5	— 9.5
12th	—	—	— 6.6	— 7.3	— 7.1	— 16.0	— 4.3	— 9.3	— 10.4	— 10.6	— 8.5	— 6.5	— 3.3	— 1.6	0.0	— 0.5	— 1.4	— 3.2	— 3.6	— 4.5	— 4.2	— 4.0	— 4.1	— 4.3
13th	— 4.7	— 4.5	— 4.2	— 4.7	— 4.6	— 3.7	— 3.3	— 3.1	— 5.0	— 5.1	— 6.1	— 5.3	— 3.7	— 3.0	— 2.0	— 0.6	0.0	— 0.8	— 1.2	— 0.7	— 1.6	— 0.5	— 0.6	— 1.4
14th	— 1.2	— 1.8	— 1.6	— 1.2	— 0.3	0.0	+ 0.6	+ 0.5	— 2.6	— 5.1	— 8.3	— 8.7	— 6.1	— 3.9	— 1.4	+ 0.7	+ 1.7	+ 1.8	+ 2.2	+ 2.3	+ 2.2	+ 2.3	+ 2.4	+ 1.9
15th	+ 2.1	+ 1.8	+ 1.3	+ 0.8	+ 1.5	+ 2.3	+ 3.3	+ 2.6	+ 1.1	— 2.0	+ 12.3	— 5.9	— 2.6	+ 0.5	+ 0.7	+ 2.7	+ 3.3	+ 3.2	+ 2.5	+ 5.9	+ 4.1	+ 2.9	+ 3.0	+ 3.1
16th	+ 2.3	+ 2.2	+ 2.4	+ 2.8	+ 3.1	+ 3.9	+ 0.3	+ 4.0	+ 6.3	— 20.0	— 13.7	— 12.0	— 6.2	— 7.5	— 6.0	— 3.0	— 3.3	— 1.4	— 1.2	— 0.4	+ 2.1	+ 1.6	— 0.7	+ 2.0
17th	— 1.2	+ 0.5	+ 0.5	— 2.9	— 1.5	— 0.5	— 0.2	— 5.7	— 10.0	— 5.4	— 4.6	— 7.3	— 7.8	— 5.0	— 2.1	+ 0.5	+ 0.9	+ 0.5	+ 0.1	+ 2.9	— 2.1	— 1.1	— 1.9	— 2.4
18th	— 2.5	— 3.2	— 2.6	— 2.1	— 2.1	— 1.2	— 0.4	— 1.5	— 1.7	— 3.5	— 5.8	— 8.0	— 3.6	— 5.3	— 2.1	— 0.2	— 1.0	+ 1.5	— 1.0	+ 0.7	— 1.5	— 0.8	— 1.3	— 0.8
19th	+ 0.8	— 0.5	— 0.2	+ 0.2	+ 0.4	+ 0.3	+ 0.3	+ 1.5	— 1.3	— 4.2	— 7.5	— 6.5	— 3.5	— 1.9	— 1.9	— 3.3	— 2.9	— 2.8	— 8.3	+ 1.4	+ 2.0	+ 2.2	+ 2.2	+ 2.5
20th	+ 2.5	+ 2.6	+ 5.1	+ 6.1	+ 4.4	+ 4.4	+ 5.0	+ 5.1	+ 3.6	+ 1.4	+ 1.0	+ 0.1	+ 2.2	+ 2.4	+ 6.5	+ 4.5	+ 4.1	+ 3.1	+ 1.2	+ 1.2	+ 8.0	+ 2.4	+ 0.7	+ 2.8
21st	+ 1.9	+ 3.2	+ 3.3	+ 4.0	+ 2.0	+ 2.7	+ 3.0	+ 2.4	+ 1.8	+ 1.6	+ 1.4	+ 0.8	+ 1.2	+ 0.8	+ 3.9	+ 5.3	+ 5.7	+ 5.4	+ 3.1	+ 6.4	+ 4.9	+ 3.5	+ 5.4	+ 3.3
22d	+ 7.7	+ 4.9	+ 2.4	+ 2.5	+ 2.0	+ 1.7	+ 3.0	+ 3.1	+ 1.8	+ 0.8	+ 2.8	— 0.2	— 2.4	— 0.9	— 0.2	— 2.9	— 2.8	+ 2.0	+ 3.7	+ 6.0	+ 1.1	+ 2.6	+ 2.7	+ 1.6
23d	+ 3.7	+ 1.7	+ 2.3	+ 3.3	+ 0.3	+ 1.1	+ 2.1	+ 3.0	+ 3.1	+ 2.6	+ 3.4	+ 0.4	— 0.6	— 0.1	— 1.1	+ 0.2	+ 4.3	+ 3.4	+ 2.5	+ 3.0	+ 3.6	+ 2.6	+ 2.2	+ 1.7
24th	+ 3.4	+ 3.6	+ 4.1	+ 3.4	—	+ 3.1	+ 3.1	+ 2.7	+ 1.3	+ 2.6	— 1.5	— 3.7	— 4.7	— 1.5	— 0.3	+ 3.0	+ 4.9	+ 4.7	+ 3.9	+ 3.5	+ 3.5	— 1.0	+ 0.4	+ 1.9
25th	+ 3.5	+ 4.6	+ 2.8	+ 2.6	+ 2.4	+ 2.3	+ 2.6	+ 1.5	+ 0.5	— 0.5	— 0.9	— 2.6	— 3.2	— 0.8	+ 0.5	+ 2.3	+ 2.5	+ 3.3	+ 0.3	+ 1.1	+ 0.7	+ 1.1	— 0.8	— 0.1
26th	+ 2.8	+ 0.6	+ 1.3	+ 0.9	+ 1.4	+ 4.2	+ 4.0	+ 0.5	— 0.2	— 3.6	— 5.2	— 7.1	— 5.4	— 4.0	— 4.9	— 0.8	+ 0.1	+ 1.1	0.0	— 9.7	— 9.0	— 3.8	— 3.8	— 1.3
27th	— 4.1	— 0.2	— 1.6	+ 0.2	—	+ 1.6	+ 1.4	+ 0.9	— 0.9	— 3.3	— 6.1	— 5.1	— 4.7	— 1.0	— 1.1	— 0.1	+ 0.3	— 1.9	— 1.8	— 1.4	— 0.5	+ 0.4	+ 3.0	+ 1.7
28th	— 0.7	— 0.2	+ 1.2	+ 0.5	+ 0.5	+ 0.6	+ 0.3	— 1.3	— 3.3	— 4.5	— 7.0	— 8.8	— 8.2	— 6.3	— 3.8	— 1.8	— 3.2	— 2.7	— 1.5	— 0.2	— 0.3	+ 0.4	+ 0.7	+ 0.9
29th	— 0.1	0.0	+ 0.6	+ 0.4	+ 0.7	+ 1.5	+ 1.5	+ 0.6	— 1.4	— 3.6	— 7.2	— 8.6	+ 2.2	+ 4.7	+ 6.4	+ 5.0	+ 4.3	+ 3.6	+ 3.9	+ 3.7	+ 4.6	+ 4.1	+ 4.3	+ 5.0
30th	+ 4.7	+ 4.8	+ 4.3	+ 4.5	+ 4.7	+ 5.2	+ 6.0	+ 6.2	+ 4.3	+ 2.2	+ 1.7	+ 0.7	+ 2.0	+ 12.2	+ 8.5	+ 8.8	+ 9.7	+ 7.9	+ 7.7	+ 7.1	+ 5.8	+ 6.7	+ 6.5	+ 5.8
31st	+ 6.2	+ 6.5	+ 6.6	+ 5.8	—	+ 6.6	+ 5.6	+ 4.8	+ 2.6	+ 0.1	+ 0.8	+ 1.3	+ 4.2	+ 7.6	+ 7.8	+ 9.9	+ 8.9	+ 9.2	+ 8.0	+ 7.0	+ 8.4	+ 7.5	+ 5.8	+ 5.9
Means	+ 2.41	+ 2.09	+ 1.95	+ 2.07	+ 2.01	+ 2.01	+ 2.58	+ 1.90	+ 0.16	— 1.71	— 2.15	— 3.21	— 1.33	+ 0.93	+ 2.18	+ 3.21	+ 3.18	+ 2.76	+ 1.94	+ 2.21	+ 2.16	+ 2.07	+ 2.04	+ 1.98
Normals	+ 2.92	+ 2.33	+ 2.47	+ 2.65	+ 2.64	+ 3.14	+ 3.31	+ 2.44	+ 1.17	— 1.04	— 1.72	— 3.61	— 1.50	+ 0.73	+ 2.94	+ 3.59	+ 4.18	+ 2.90	+ 2.31	+ 3.83	+ 3.15	+ 2.80	+ 2.66	+ 2.64

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JANUARY 1861.

Value of a part of division = 0.0001,93.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 6.8	—	—	—	—	+ 5.8	—	—	+ 3.5	+ 1.8	— 0.6	— 1.1	+ 0.8	+ 3.8	+ 5.0	+ 7.3	+ 8.2	+ 7.8	+ 6.9	+ 6.1	+ 5.9	+ 4.9	—	+ 5.2
2d	+ 5.1	+ 4.9	+ 4.9	+ 5.1	+ 5.7	+ 6.1	+ 7.9	+ 5.9	+ 5.3	+ 4.4	+ 3.5	+ 3.0	+ 4.4	+ 6.6	+ 8.8	+ 8.7	+ 9.9	+ 7.6	+ 7.6	+ 7.2	+ 7.9	+ 9.8	+ 7.4	+ 7.7
3d	+ 7.3	+ 7.3	+ 7.8	+ 6.8	+ 6.3	+ 7.7	+ 7.2	+ 6.7	+ 1.5	+ 2.0	+ 1.7	+ 1.0	+ 0.9	+ 0.3	+ 3.5	+ 6.2	+ 5.2	+ 5.5	+ 5.3	+ 4.3	+ 2.8	+ 4.9	+ 4.2	+ 4.7
4th	—	+ 5.0	—	+ 4.8	—	+ 4.8	+ 5.5	+ 5.0	+ 2.5	+ 0.6	— 1.0	— 1.0	— 0.5	+ 0.7	+ 2.0	+ 3.8	+ 6.0	+ 7.2	+ 8.4	+ 7.0	+ 6.8	+ 6.5	+ 6.6	+ 6.4
5th	+ 7.6	+ 7.2	—	+ 5.3	+ 5.6	+ 5.1	+ 5.1	+ 4.5	+ 4.1	+ 5.4	+ 4.0	+ 1.3	— 1.3	— 2.0	— 2.4	+ 0.9	+ 1.2	+ 3.4	+ 6.4	+ 5.0	+ 4.0	—	+ 4.5	+ 4.1
6th	+ 4.5	+ 4.3	+ 4.2	+ 4.3	+ 4.4	+ 5.0	+ 6.2	+ 7.8	+ 8.6	+ 8.1	+ 6.8	+ 5.9	+ 5.1	+ 4.7	+ 4.3	+ 5.0	+ 6.9	+ 8.6	+ 9.1	+ 8.7	+ 6.6	+ 9.0	+ 9.0	+ 9.4
7th	+ 8.8	+ 10.4	+ 8.6	+ 7.9	+ 4.8	+ 1.1	+ 0.8	+ 0.4	— 0.2	— 0.3	+ 0.2	— 0.8	— 0.4	+ 1.4	+ 1.3	+ 1.9	+ 3.5	+ 3.1	+ 3.5	+ 3.3	+ 2.6	+ 2.3	+ 3.0	+ 3.0
8th	—	+ 2.3	+ 3.2	+ 3.3	+ 3.2	+ 2.7	+ 2.6	+ 2.7	+ 3.1	+ 1.4	+ 0.4	+ 1.5	+ 3.0	+ 4.0	+ 6.9	+ 5.8	+ 4.1	+ 4.5	+ 5.8	+ 6.0	+ 5.2	+ 3.9	+ 4.9	+ 5.2
9th	+ 5.1	+ 4.5	+ 4.1	+ 4.1	—	+ 4.8	+ 3.2	+ 1.2	+ 1.0	+ 0.5	+ 1.4	+ 3.0	+ 5.5	+ 7.3	+ 7.8	+ 9.0	+ 10.6	+ 5.8	+ 6.8	+ 4.8	+ 6.8	+ 8.6	—	+ 5.9
10th	+ 5.2	+ 3.8	+ 4.5	+ 4.9	+ 4.9	+ 4.2	+ 3.6	+ 1.2	— 1.6	— 2.8	+ 0.1	+ 2.8	+ 6.3	+ 6.6	+ 6.9	+ 7.7	+ 6.7	+ 4.9	+ 5.0	+ 6.8	+ 6.6	+ 6.0	+ 5.9	+ 5.9
11th	+ 5.5	+ 4.8	—	+ 5.5	+ 6.0	+ 6.2	+ 5.9	+ 4.4	+ 3.7	+ 3.3	+ 1.3	+ 1.6	+ 4.0	+ 8.8	+ 9.9	+ 12.4	+ 11.0	+ 9.2	+ 6.6	+ 5.3	+ 6.7	+ 6.3	+ 6.9	+ 5.8
12th	—	+ 4.8	+ 5.5	+ 6.9	+ 4.1	— 2.7	+ 7.3	+ 6.1	+ 3.9	+ 1.6	+ 0.7	+ 0.2	+ 2.4	+ 5.2	+ 9.0	+ 7.3	+ 13.1	+ 8.7	+ 11.6	+ 11.9	+ 7.2	+ 10.0	+ 8.6	+ 9.4
13th	—	+ 9.2	+ 8.1	+ 8.6	—	+ 7.9	+ 7.8	+ 6.8	+ 2.8	— 4.5	— 9.4	— 2.7	— 1.2	+ 3.6	+ 2.1	+ 3.4	+ 6.6	+ 6.6	+ 6.2	+ 5.8	+ 6.9	+ 7.1	+ 6.4	+ 10.6
14th	+ 6.1	+ 2.9	+ 3.7	+ 4.4	+ 4.5	+ 5.5	+ 5.9	+ 5.2	+ 4.4	+ 2.0	— 0.3	— 1.7	— 2.1	+ 1.0	+ 4.4	+ 6.6	+ 7.8	+ 7.8	+ 4.9	+ 4.2	+ 4.5	+ 5.0	+ 5.2	+ 6.3
15th	+ 7.7	+ 6.6	+ 6.3	+ 6.6	+ 7.5	+ 6.6	+ 5.8	+ 4.6	+ 1.7	+ 1.1	— 1.0	— 3.6	— 0.1	+ 1.5	+ 6.6	+ 8.4	+ 5.9	+ 5.9	+ 4.4	+ 3.6	+ 2.9	+ 3.1	+ 4.2	+ 4.2
16th	+ 4.8	+ 6.6	+ 8.0	+ 6.0	+ 4.1	+ 4.6	+ 5.0	+ 5.4	+ 3.6	+ 1.1	— 1.5	— 2.1	— 0.8	— 1.2	+ 2.2	+ 4.5	+ 6.9	+ 6.0	+ 5.6	+ 5.5	+ 6.1	+ 4.1	+ 4.0	+ 6.3
17th	+ 3.9	+ 4.6	+ 3.6	+ 3.8	+ 4.2	+ 4.4	+ 4.7	+ 3.9	+ 3.0	+ 1.4	— 0.3	— 1.5	+ 1.2	+ 2.6	+ 3.1	+ 3.0	+ 4.2	+ 4.1	+ 4.6	+ 3.4	+ 3.0	+ 3.9	+ 3.8	+ 4.0
18th	+ 3.3	+ 3.7	+ 3.5	+ 3.9	+ 3.8	+ 2.1	+ 3.7	+ 3.5	+ 2.9	+ 1.6	— 0.8	— 1.6	— 0.3	+ 1.4	+ 2.1	+ 3.3	+ 6.2	+ 6.3	+ 5.4	+ 4.1	+ 3.4	+ 3.7	+ 3.9	+ 3.2
19th	+ 2.5	+ 3.1	+ 2.8	+ 3.8	+ 3.4	+ 3.4	+ 4.1	+ 2.9	+ 0.7	— 2.5	— 3.7	— 3.2	— 1.7	+ 1.0	+ 0.4	+ 2.3	+ 2.7	+ 3.1	+ 3.6	+ 2.7	+ 1.9	+ 3.2	+ 2.3	+ 2.3
20th	+ 1.9	+ 1.8	+ 2.4	+ 2.5	+ 1.6	+ 1.3	+ 0.3	+ 3.4	+ 3.8	+ 0.9	+ 1.2	— 0.7	0.0	+ 2.5	+ 3.8	+ 5.6	+ 7.0	+ 7.5	+ 7.8	+ 4.5	+ 5.3	+ 6.2	+ 5.5	+ 10.8
21st	0.0	+ 1.1	+ 1.9	+ 2.8	+ 2.7	+ 4.1	+ 2.1	+ 2.2	— 0.4	+ 0.1	— 0.5	— 3.2	— 0.6	+ 1.6	+ 1.1	+ 3.5	+ 8.2	+ 7.0	+ 9.4	+ 2.3	+ 2.2	+ 4.8	+ 4.2	+ 5.7
22d	+ 3.7	+ 4.5	+ 5.3	+ 5.5	+ 5.0	+ 5.4	+ 6.2	+ 5.8	+ 5.3	+ 5.0	+ 4.0	+ 1.5	+ 0.6	+ 2.5	+ 3.9	+ 5.2	+ 7.1	+ 8.4	+ 7.6	+ 7.1	+ 2.7	+ 4.0	+ 6.2	+ 6.5
23d	+ 9.9	+ 9.6	+ 7.5	+ 7.3	+ 15.1	+ 7.2	— 3.1	— 2.0	+ 0.6	— 3.6	— 2.6	— 2.6	— 4.8	— 4.4	— 1.2	+ 0.1	+ 0.1	+ 1.6	+ 8.5	+ 2.0	+ 2.0	+ 1.9	+ 1.6	+ 1.0
24th	— 3.6	— 1.2	+ 1.8	— 0.8	— 0.4	— 0.4	— 1.9	— 4.8	— 5.1	— 4.2	— 8.2	— 12.3	— 9.7	— 2.6	— 2.1	— 2.0	+ 1.1	— 2.9	+ 1.2	+ 1.3	—	— 7.6	+ 11.4	+ 0.5
25th	—	—	—	—	—	—	— 9.3	— 16.5	— 11.0	— 18.6	— 19.2	— 12.5	— 18.4	— 14.5	— 14.0	— 6.3	— 8.2	— 3.1	— 5.0	— 12.1	— 3.3	— 4.9	+ 3.7	— 1.4
26th	+ 4.3	+ 9.2	— 2.4	+ 1.5	— 3.8	+ 2.6	— 4.1	— 3.2	+ 0.8	+ 2.5	— 14.1	— 13.2	— 16.2	— 13.5	— 10.9	— 5.9	— 5.7	+ 0.4	— 4.6	— 3.5	+ 0.2	— 3.4	— 3.0	— 3.7
27th	+ 7.3	+ 0.8	— 4.3	— 2.8	+ 0.2	+ 12.2	+ 13.4	+ 1.1	— 18.3	— 9.9	— 15.8	— 19.7	— 16.2	— 12.5	— 12.6	— 14.9	— 11.5	— 4.4	— 12.6	— 5.5	+ 4.5	— 6.5	— 6.7	— 9.1
28th	— 10.9	— 6.7	— 5.3	—	— 4.6	— 4.5	— 5.8	— 5.8	— 8.1	— 8.3	— 9.2	— 10.7	— 11.0	— 8.7	— 2.5	— 3.0	+ 0.4	+ 1.3	+ 0.1	— 0.6	+ 0.8	+ 0.2	+ 0.3	+ 0.6
29th	+ 0.6	— 0.4	— 0.7	+ 0.4	+ 1.6	+ 2.0	+ 0.7	0.0	— 0.2	— 2.3	— 5.3	— 1.5	— 8.7	— 8.7	— 4.7	— 1.6	0.0	+ 0.9	— 0.5	+ 1.3	+ 2.2	+ 2.0	+ 2.8	+ 2.3
30th	+ 1.0	+ 1.5	+ 1.5	+ 2.1	+ 2.0	+ 6.0	+ 7.9	+ 1.3	+ 7.2	+ 2.1	+ 1.7	— 6.5	— 6.2	— 5.2	— 3.4	— 1.8	+ 1.7	+ 3.8	+ 3.3	+ 1.7	+ 0.8	+ 0.7	+ 3.8	— 1.8
31st	+ 0.6	+ 1.0	+ 1.2	+ 1.2	+ 1.3	+ 1.7	+ 1.8	+ 1.3	— 0.5	— 3.1	— 5.2	— 8.2	— 8.9	— 8.3	— 5.4	— 2.7	— 0.2	— 10.8	— 10.9	+ 1.1	+ 1.1	+ 0.2	+ 2.9	+ 1.6
Means	+ 3.81	+ 4.04	+ 3.37	+ 4.13	+ 3.58	+ 4.12	+ 3.35	+ 2.03	+ 0.92	— 0.43	— 2.31	— 2.86	— 2.42	— 0.52	+ 1.16	+ 2.70	+ 4.09	+ 4.06	+ 3.94	+ 3.40	+ 3.88	+ 3.26	+ 4.26	+ 3.95
Normals	+ 4.73	+ 4.20	+ 4.33	+ 4.39	+ 3.76	+ 4.40	+ 4.64	+ 3.47	+ 2.21	+ 0.57	— 0.48	— 0.75	— 0.58	+ 1.35	+ 2.18	+ 3.97	+ 4.70	+ 5.44	+ 5.52	+ 4.24	+ 4.13	+ 4.41	+ 4.68	+ 4.22

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF FEBRUARY 1861.

Value of a part of division = 0.0001,93.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.3	— 2.8	+ 2.2	—	+ 1.7	+ 1.2	— 0.8	— 2.6	+ 0.4	— 1.9	— 7.1	— 9.3	— 11.8	— 7.6	— 6.4	— 3.2	— 2.7	—	— 2.8	— 4.8	— 2.0	— 1.7	— 1.9	— 0.9
2d	— 0.9	+ 1.5	— 2.1	— 3.8	— 2.8	— 2.1	— 3.6	— 3.5	— 3.3	— 4.4	— 7.4	— 10.3	— 6.9	— 6.7	— 4.5	— 2.8	— 3.7	— 3.3	— 1.1	— 1.9	— 1.2	+ 0.1	— 0.9	— 1.9
3d	— 2.6	+ 2.0	— 1.4	— 1.6	— 0.7	+ 0.1	— 2.1	— 2.7	— 3.8	— 5.5	— 5.9	— 8.1	— 7.6	— 4.1	— 1.8	— 0.5	— 1.5	— 2.9	— 3.0	— 3.5	— 4.3	— 3.7	— 3.5	— 3.3
4th	— 4.0	+ 4.1	— 3.9	— 4.0	— 4.1	— 4.4	— 3.8	— 3.3	— 3.0	— 2.8	— 3.8	— 3.4	— 2.7	— 1.1	— 0.7	— 0.4	— 0.3	— 0.1	— 1.4	— 0.3	— 1.1	— 0.8	— 1.2	— 1.8
5th	— 1.6	— 1.7	— 1.6	— 1.6	—	— 0.1	— 2.6	— 3.5	— 5.1	— 2.7	— 1.8	— 2.1	— 0.3	0.0	+ 0.2	+ 0.7	+ 1.1	— 1.2	— 2.3	— 2.7	— 0.8	— 2.1	— 2.2	— 1.6
6th	— 2.5	— 2.0	— 1.6	— 0.6	—	—	— 0.9	— 1.9	— 2.2	— 2.3	— 1.9	— 2.0	+ 1.2	+ 2.6	+ 3.5	+ 4.1	+ 3.5	+ 5.2	+ 5.4	+ 4.3	+ 3.9	+ 4.7	+ 4.2	+ 3.9
7th	+ 4.5	+ 3.0	+ 6.2	+ 3.9	+ 4.1	+ 4.1	+ 3.6	+ 2.4	+ 1.8	— 0.6	— 0.5	— 2.2	— 0.1	+ 1.3	+ 1.9	+ 4.4	+ 6.4	+ 6.9	+ 7.0	+ 6.5	+ 6.2	+ 5.2	+ 3.5	+ 4.7
8th	+ 5.6	+ 6.1	+ 6.4	+ 4.8	+ 5.1	+ 5.5	+ 5.6	+ 4.2	+ 3.5	+ 0.9	— 1.6	— 3.2	— 2.4	— 0.1	+ 1.1	+ 3.9	— 2.9	+ 5.6	+ 4.5	+ 4.2	+ 4.4	+ 4.8	+ 3.9	+ 3.1
9th	+ 4.1	+ 3.1	+ 5.7	+ 6.8	+ 4.1	+ 3.4	+ 2.6	+ 4.3	+ 2.1	+ 0.5	— 2.9	— 4.5	— 5.2	— 4.1	— 2.3	+ 0.2	+ 2.0	+ 2.6	+ 3.1	+ 4.4	—	—	—	+ 2.8
10th	+ 3.2	+ 3.9	+ 3.6	+ 4.2	+ 4.5	+ 4.7	+ 5.6	+ 5.4	+ 5.0	+ 2.7	0.0	— 1.1	— 0.3	+ 2.4	+ 2.4	+ 3.4	+ 6.2	+ 6.1	+ 4.7	+ 5.9	+ 5.7	+ 3.8	+ 1.6	+ 4.7
11th	+ 3.3	+ 3.9	+ 3.6	+ 2.9	+ 3.8	+ 6.9	+ 4.0	+ 3.5	+ 3.0	+ 0.7	— 2.3	— 3.8	— 10.6	— 5.9	— 3.0	+ 1.3	+ 2.5	+ 1.2	+ 2.5	— 0.6	+ 0.6	— 1.5	+ 3.5	+ 2.2
12th	+ 0.6	— 0.1	+ 0.9	+ 0.4	+ 0.8	+ 1.2	+ 2.0	+ 1.3	— 3.7	— 3.1	— 3.6	— 3.5	— 2.2	— 1.7	— 0.4	— 0.5	+ 2.6	+ 2.8	+ 4.3	+ 2.9	+ 3.4	+ 1.8	+ 2.2	+ 3.0
13th	+ 5.0	+ 3.2	+ 7.3	+ 3.0	+ 3.3	+ 2.1	+ 2.7	—	+ 0.3	— 3.4	— 5.3	— 4.3	— 3.7	— 2.0	— 1.8	— 2.7	— 1.7	+ 1.5	+ 2.1	+ 2.6	+ 2.3	+ 3.1	+ 2.6	+ 3.9
14th	+ 2.1	+ 2.7	+ 2.4	+ 2.8	+ 2.6	+ 2.8	+ 3.7	+ 3.8	+ 3.2	+ 2.3	— 0.5	— 3.3	— 3.4	— 3.4	— 1.9	+ 0.5	+ 1.3	+ 2.8	+ 3.1	+ 3.0	+ 3.4	+ 3.0	+ 2.9	+ 2.7
15th	+ 2.4	+ 2.3	+ 2.4	+ 3.5	+ 3.5	+ 4.2	+ 5.5	— 0.1	+ 4.8	+ 3.5	+ 0.5	— 3.0	— 4.7	— 4.1	— 1.3	— 0.7	+ 1.9	+ 3.8	+ 3.6	+ 3.5	+ 3.7	+ 3.3	+ 2.8	+ 2.8
16th	+ 3.6	+ 3.7	+ 4.7	+ 5.8	+ 7.8	+ 2.5	+ 1.2	+ 3.3	+ 2.3	+ 1.3	— 0.5	— 2.6	— 4.6	— 3.5	— 0.5	— 2.7	+ 2.9	+ 4.1	+ 4.7	+ 3.9	+ 6.5	+ 5.2	+ 2.5	+ 8.8
17th	+ 2.1	+ 2.4	+ 4.1	+ 3.3	+ 3.9	+ 1.1	+ 3.2	+ 3.5	+ 4.7	+ 1.6	+ 0.2	— 1.5	— 1.5	— 2.3	— 2.6	— 0.6	+ 2.2	+ 3.9	+ 2.2	+ 1.9	+ 2.5	— 2.4	— 0.6	— 0.4
18th	— 1.2	+ 2.5	+ 2.2	+ 0.5	+ 0.7	+ 3.7	+ 3.1	+ 2.0	+ 1.0	— 0.7	— 2.3	— 4.5	— 4.7	— 1.7	+ 0.5	+ 1.9	+ 4.5	+ 5.6	+ 2.8	+ 2.5	+ 2.1	+ 2.0	+ 1.5	+ 1.8
19th	+ 1.7	+ 1.7	+ 5.3	+ 2.3	+ 2.0	+ 2.2	+ 0.1	+ 2.3	+ 2.4	— 0.2	— 3.4	— 5.1	— 4.4	— 3.0	— 1.5	+ 1.1	+ 2.1	+ 3.5	+ 5.1	+ 5.0	+ 5.4	+ 5.8	+ 4.9	+ 2.4
20th	+ 4.4	+ 7.6	+ 2.7	+ 3.5	+ 3.9	+ 4.7	+ 5.2	+ 4.8	+ 4.3	+ 3.5	+ 1.9	+ 0.2	+ 0.2	+ 1.1	+ 2.9	+ 5.4	+ 5.8	+ 6.5	+ 5.1	+ 5.7	+ 5.9	+ 6.1	+ 5.7	+ 5.8
21st	+ 5.7	+ 5.7	+ 5.7	+ 5.8	+ 6.6	+ 6.2	+ 6.1	+ 6.7	+ 6.0	+ 3.9	+ 2.9	+ 2.0	+ 3.4	+ 5.8	+ 6.8	+ 6.6	+ 7.3	+ 6.6	+ 6.2	+ 7.6	+ 8.5	+ 6.5	+ 6.7	+ 7.2
22d	+ 6.8	+ 6.4	+ 6.3	+ 9.6	+ 7.2	+ 4.4	+ 7.5	+ 3.2	+ 0.5	+ 3.5	+ 4.8	+ 3.2	+ 2.9	+ 2.5	+ 2.6	+ 1.9	+ 3.2	+ 2.6	+ 3.8	+ 4.0	+ 4.9	+ 3.4	+ 3.3	+ 1.0
23d	+ 3.0	+ 4.0	+ 4.1	+ 2.9	+ 3.7	+ 4.5	+ 6.2	+ 5.2	+ 3.6	+ 11.3	— 1.4	— 2.0	— 1.9	+ 0.1	— 0.2	+ 2.5	+ 3.2	+ 1.6	+ 3.2	+ 4.3	+ 5.2	+ 4.9	+ 5.1	+ 4.7
24th	+ 4.6	+ 4.6	+ 4.6	+ 4.6	+ 4.8	+ 5.0	+ 5.6	+ 5.4	+ 5.0	+ 3.9	+ 2.5	+ 1.1	+ 1.3	+ 2.0	+ 1.6	+ 3.0	+ 4.1	+ 5.4	+ 4.9	+ 6.0	+ 6.7	+ 5.7	+ 5.6	+ 5.5
25th	+ 5.8	+ 5.6	+ 5.5	+ 8.2	+ 8.8	+ 8.1	+ 6.9	+ 6.7	+ 5.5	+ 3.9	+ 1.5	— 0.7	— 1.2	— 0.4	+ 0.7	+ 3.1	+ 4.6	+ 3.6	+ 4.0	+ 5.6	+ 6.3	+ 5.6	+ 4.7	+ 5.1
26th	+ 4.7	+ 4.4	+ 4.9	+ 5.6	—	—	+ 5.8	+ 6.6	+ 6.8	+ 5.7	+ 4.1	+ 3.4	+ 3.7	+ 3.2	+ 4.4	+ 6.2	+ 5.7	+ 5.4	+ 6.3	+ 7.0	+ 5.9	+ 4.7	+ 5.9	+ 6.7
27th	+ 5.3	+ 5.9	+ 6.3	+ 6.7	+ 7.5	+ 7.7	+ 7.6	+ 7.2	+ 5.6	+ 4.8	+ 3.3	+ 4.8	+ 4.0	+ 4.9	+ 5.7	+ 7.8	+ 7.8	+ 8.5	+ 8.0	+ 7.8	+ 10.1	+ 9.6	+ 5.4	+ 4.7
28th	+ 8.7	+ 6.4	+ 0.4	— 0.5	+ 1.2	+ 2.6	— 0.4	+ 5.3	— 6.9	— 9.6	— 7.7	— 6.4	— 9.2	— 8.7	— 6.7	— 3.9	— 2.0	— 1.8	— 4.9	— 4.5	— 4.5	— 6.4	— 4.4	— 5.0
Means	+ 2.70	+ 2.93	+ 3.10	+ 2.93	+ 3.36	+ 3.17	+ 2.84	+ 2.57	+ 1.56	+ 0.56	— 1.36	— 2.58	— 2.60	— 1.23	— 0.05	+ 1.43	+ 2.36	+ 3.20	+ 2.90	+ 2.87	+ 3.32	+ 2.62	+ 2.36	+ 2.59
Normals	+ 2.95	+ 3.19	+ 3.36	+ 3.22	+ 3.95	+ 3.47	+ 3.35	+ 2.57	+ 2.15	+ 0.54	— 1.36	— 2.30	— 2.12	— 0.96	+ 0.20	+ 1.19	+ 2.36	+ 3.71	+ 3.67	+ 3.99	+ 3.68	+ 2.97	+ 2.62	+ 2.65

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MARCH 1861.

Value of a part of division = 0.000193.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	-7.6	-4.8	-1.0	-2.1	-3.3	+5.0	-1.1	-6.7	-1.4	-5.5	-9.1	-13.0	-12.7	-12.0	-9.2	-6.0	-5.0	-4.0	-0.9	-4.5	-0.5	+0.4	+0.7	-2.6
2d	-1.4	-5.0	-4.2	+0.6	-2.0	-2.0	-5.3	-	-2.9	-5.7	-7.0	-9.9	-7.0	-4.8	-3.8	+0.3	-0.2	-2.6	-3.2	-3.0	+2.1	-0.5	+0.7	+0.5
3d	+2.7	+2.4	+2.6	-2.3	-0.3	-0.8	-0.9	-1.0	-2.3	-3.2	-3.2	-2.3	-0.6	-0.2	-0.5	+2.6	+2.3	+3.5	+2.9	+3.8	+3.0	+2.1	+3.0	+2.4
4th	+2.7	+3.0	+2.2	+2.3	+2.1	+2.3	+2.5	+1.5	-0.3	-3.4	-6.6	-7.9	-5.5	-2.7	+0.6	+2.9	+3.4	+3.5	+3.6	+4.6	+5.6	+4.5	+5.4	+4.4
5th	+6.2	+6.2	+6.8	+7.3	+6.6	+7.3	+7.8	+8.1	+6.2	+4.6	+0.9	-1.2	-1.5	+1.2	+5.5	+7.7	+8.4	+8.4	+7.1	+7.1	+7.8	+7.5	+6.9	+7.6
6th	+7.2	+7.2	+7.2	+7.1	-	-	+7.1	+8.2	+6.8	+3.8	+1.4	-0.9	-0.7	+2.0	+6.1	+9.5	+11.1	+8.3	+6.7	+7.0	+7.9	+6.9	+6.9	+7.0
7th	+7.2	+6.9	+8.5	+8.5	+8.5	+8.7	+8.6	+7.7	+6.7	+5.1	-0.8	-1.0	-0.1	+1.8	+4.9	+8.9	+9.1	+8.8	+8.7	+8.6	+9.0	+9.9	+9.7	+8.7
8th	+8.7	+9.3	+9.3	+9.6	+9.3	+9.1	+8.9	+8.7	+8.3	+6.7	+5.2	+4.2	+2.4	+2.6	+4.8	+5.5	+7.1	+7.8	+7.1	+8.9	+8.8	+9.0	+8.8	+9.3
9th	+9.0	+8.9	+8.8	+9.5	+9.4	+9.5	+9.7	+9.1	+7.2	+4.6	+2.6	+1.8	+3.4	+4.6	+5.7	+8.2	+8.8	+8.8	+14.0	+13.3	+11.5	+10.4	+12.6	+9.0
10th	+10.5	+8.4	+8.2	+3.4	+5.6	+5.3	+4.2	+7.0	-6.7	-5.5	-9.5	-10.4	-13.7	-14.7	-5.7	-3.4	-4.4	-3.0	-8.5	-4.1	-3.9	-1.1	-0.8	-0.7
11th	+1.7	-1.5	-0.3	+0.1	+0.7	+1.9	+2.7	+1.3	+0.6	-4.1	-9.5	-8.4	-6.6	-3.7	-1.7	+0.8	-0.1	+0.6	+1.2	+2.1	+2.7	+2.8	+3.0	+2.7
12th	+2.8	+1.4	+3.3	+3.8	+4.3	+4.5	+3.4	+4.9	+4.0	+0.7	+1.0	-5.0	-11.5	-6.6	-1.5	+1.4	+1.4	+4.8	+5.1	+4.4	+4.3	+4.5	+4.4	+4.5
13th	+5.4	-	+4.9	+4.3	+4.5	+5.4	+5.6	+5.1	+3.2	+1.0	0.0	-0.3	+0.9	+3.2	+5.3	+6.3	+5.8	+6.2	+5.4	+4.9	+5.7	+6.2	+6.5	+6.3
14th	+6.3	+6.4	+6.1	+6.5	+6.7	+7.3	+6.7	+7.0	+4.9	+0.8	-3.1	-4.2	-2.8	+2.1	+4.5	+1.0	+4.6	+0.6	-1.1	+0.4	-9.0	+1.2	+5.4	+9.4
15th	+7.6	+8.5	+6.2	+8.3	+7.2	+6.3	+8.4	+5.1	+4.8	+2.4	-0.7	-1.5	-1.7	+0.7	+3.0	+6.0	+7.3	+8.1	+8.9	+9.8	+9.8	+8.4	+7.3	+7.9
16th	+8.3	+7.9	+8.8	+8.2	+8.8	+9.5	+10.5	+8.6	+7.7	+5.4	+3.2	-0.7	+0.4	+2.9	+4.1	+7.5	+6.1	-	+6.5	+2.4	+6.0	+5.7	+6.8	+11.5
17th	+7.0	+7.3	+7.4	+7.8	+7.3	+7.2	+8.7	+6.9	+5.0	+2.3	-0.6	-1.2	+0.2	+2.4	+5.9	+6.7	+7.2	+6.6	+7.2	+7.2	+6.8	+7.7	+7.3	+7.3
18th	+7.5	+10.5	+8.6	+7.9	+8.4	+8.2	+8.4	+7.6	+8.1	+6.3	+3.3	-0.1	+0.2	+0.6	+2.2	+3.9	+6.7	+6.6	+6.6	+6.3	+7.9	+9.2	+7.5	+5.9
19th	+7.5	+8.4	+8.9	+7.9	+6.1	+6.4	+7.0	+5.9	+5.4	+4.0	+2.6	+1.5	+1.9	-0.5	+2.4	+4.9	+3.3	+3.1	+3.4	+3.4	+3.9	+2.9	+10.6	+3.8
20th	-0.4	+2.0	+1.3	+0.4	-1.6	-1.3	-3.5	-2.1	-3.1	-5.0	-7.5	-14.0	-9.9	-5.9	-0.8	-5.1	-1.7	-0.5	-1.5	-0.8	+0.3	-3.4	-4.6	-3.3
21st	+3.4	-1.9	-1.9	-0.5	0.0	-0.1	-0.2	-1.2	-1.9	-2.3	-3.9	-1.9	-5.0	-5.3	-2.2	-0.2	+0.8	+0.7	+0.7	-0.9	-0.5	-0.7	-1.4	-1.1
22d	+1.2	+0.9	+0.8	+1.0	+0.8	+1.0	+0.9	-1.0	+0.2	+1.5	+1.1	-0.2	+1.3	+1.8	+3.2	+3.9	+4.3	+2.1	+3.6	+4.0	+3.1	+2.7	+3.0	+3.5
23d	+2.9	+3.3	+2.9	+3.5	+3.1	+3.2	+3.2	+2.4	+2.0	-0.3	-2.3	-1.6	-1.3	+0.5	+0.9	+1.6	+2.6	+2.5	+2.6	+1.7	+2.3	+1.6	-0.1	+1.2
24th	+2.2	-0.9	-2.1	-3.7	+2.1	-1.5	+0.1	-0.8	-0.4	-4.0	-7.3	-5.9	-6.0	-6.2	-1.5	+1.1	+0.4	-1.9	-0.6	+1.7	+2.1	+4.1	+4.0	+3.9
25th	-	+2.9	+3.1	+4.6	+4.5	+5.0	+5.0	+3.4	+3.3	+2.4	+0.1	+0.8	+1.6	+1.8	+1.7	+1.9	+2.4	+1.9	+4.0	-1.0	+0.6	+0.4	-5.2	-5.0
26th	+1.3	+0.2	-2.1	+3.8	0.0	+5.8	+1.3	+0.1	-2.1	-4.9	-4.0	-8.2	-4.9	-1.7	-2.2	+0.1	-1.3	-1.7	-1.8	-	-0.8	0.0	+5.9	+3.5
27th	+1.8	+4.7	+1.4	+7.7	+5.6	+5.2	+5.8	+4.7	+1.6	-0.6	-2.1	-2.5	-0.4	-3.1	+0.1	+1.5	+2.3	+2.5	+2.3	+2.9	+5.1	+3.5	+2.3	+4.7
28th	+5.9	-1.5	-5.4	+4.6	+7.8	+7.0	+6.7	+5.6	+2.7	-1.4	-1.7	-2.2	-0.8	-1.1	+2.9	+3.0	+4.4	+1.9	+0.9	+4.1	+6.6	+3.0	+2.8	+4.3
29th	+4.3	+3.7	+8.2	+3.5	+6.7	-	-	+5.4	+3.8	+1.5	-1.2	-2.0	-3.5	-0.2	+5.1	+6.1	+5.5	+5.2	+2.6	+6.4	+7.0	+6.4	+7.0	+7.6
30th	+7.6	+5.1	+5.9	+5.8	+6.4	+5.1	+5.4	+6.3	+4.8	+2.1	-0.7	-1.4	-0.6	+2.9	+2.5	+3.8	+3.5	+4.7	+2.4	+5.7	+6.6	+6.1	+7.6	+6.9
31st	+7.0	+6.6	+9.1	+7.9	+6.8	+7.0	+7.6	+4.4	+5.4	+3.4	+0.6	-2.2	-2.8	-2.2	-0.3	+0.6	+3.1	+4.4	+4.7	+8.1	+7.2	+7.8	+6.2	+5.2
Means	+4.55	+3.88	+3.98	+4.43	+4.40	+4.74	+4.51	+4.07	+2.63	+0.41	-1.90	-3.28	-2.82	-1.28	+1.35	+3.00	+3.52	+3.26	+3.25	+3.82	+4.16	+4.17	+4.52	+4.40
Normals	+5.20	+4.53	+5.61	+5.19	+5.15	+5.72	+5.61	+4.68	+2.94	+0.20	-0.84	-2.26	-1.65	-0.45	+1.96	+3.63	+3.84	+3.98	+3.51	+4.34	+4.66	+4.21	+5.14	+5.03

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF APRIL 1861.

Value of a part of division = 0.000193.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON,	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 2.3	+ 4.4	+ 6.5	+ 4.5	+ 5.4	+ 6.2	+ 6.6	+ 5.5	+ 5.4	+ 3.6	+ 0.7	- 0.9	- 2.2	- 0.5	+ 1.5	+ 2.7	+ 5.4	+ 5.6	+ 5.3	+ 6.5	+ 7.4	+ 7.2	+ 6.7	+ 6.6
2d	+ 7.3	+ 6.4	+ 7.0	+ 6.3	+ 6.7	+ 8.1	+ 6.3	+ 6.8	+ 5.3	+ 2.9	+ 0.4	- 1.6	- 0.8	+ 0.7	+ 2.3	+ 4.8	+ 5.3	+ 5.4	-	+ 7.4	+ 7.7	+ 7.5	+ 7.8	+ 7.8
3d	+ 7.3	+ 7.5	+ 7.4	+ 7.2	+ 7.4	+ 5.9	+ 7.0	+ 7.3	+ 5.6	+ 4.2	+ 2.0	+ 0.1	- 0.6	- 1.1	+ 2.1	+ 3.3	+ 5.2	+ 6.3	+ 6.0	+ 7.0	+ 6.8	+ 6.5	+ 6.0	+ 6.2
4th	+ 5.7	+ 5.9	+ 6.3	+ 5.7	+ 5.7	+ 5.7	+ 5.9	+ 4.9	+ 4.6	+ 4.3	+ 3.1	+ 1.3	+ 1.3	+ 2.7	+ 4.4	+ 5.2	+ 5.6	+ 6.0	-	+ 6.7	+ 7.0	+ 7.3	+ 7.0	+ 6.5
5th	+ 7.3	+ 6.7	+ 5.2	+ 7.0	+ 6.3	+ 6.1	+ 6.5	+ 6.0	+ 4.9	+ 1.3	+ 0.9	+ 0.5	+ 2.2	+ 9.6	+ 7.1	+ 4.0	+ 8.7	+ 3.1	-	+ 4.9	+ 7.5	- 1.7	+ 3.2	+ 1.7
6th	+ 3.1	+ 2.1	+ 2.7	+ 2.7	+ 2.8	+ 3.2	+ 4.1	-	+ 3.1	+ 4.1	+ 3.1	+ 1.3	+ 0.6	+ 0.6	+ 1.8	+ 4.5	+ 5.1	+ 4.6	+ 5.5	+ 4.9	+ 6.5	+ 5.1	+ 4.4	+ 2.8
7th	+ 3.4	+ 3.4	+ 2.9	+ 3.0	+ 2.6	+ 2.9	+ 3.6	+ 2.8	+ 2.3	+ 1.8	+ 0.6	- 0.5	+ 1.4	+ 2.1	+ 1.8	+ 5.1	+ 4.8	+ 5.0	+ 5.8	+ 6.2	+ 6.5	+ 6.1	+ 6.0	+ 6.5
8th	+ 5.8	+ 5.8	+ 6.5	+ 6.8	+ 6.1	+ 5.1	+ 3.7	+ 1.6	- 0.2	+ 1.0	+ 0.7	- 0.1	- 0.1	+ 1.1	+ 1.8	+ 3.5	+ 3.5	+ 3.1	+ 4.9	+ 5.9	+ 6.0	+ 5.5	+ 4.0	+ 4.4
9th	+ 3.6	+ 5.9	+ 6.0	+ 5.4	+ 6.9	+ 7.2	+ 5.7	+ 5.2	+ 3.1	+ 0.2	- 0.4	- 1.8	- 1.2	- 2.8	- 0.8	+ 2.3	+ 2.3	+ 1.7	+ 2.6	+ 3.0	+ 3.4	+ 3.8	+ 3.9	+ 3.7
10th	+ 3.6	+ 3.9	+ 3.3	+ 2.7	+ 3.8	+ 4.0	+ 3.6	+ 1.0	+ 3.2	+ 3.8	+ 4.6	+ 3.9	- 2.3	- 0.9	+ 0.3	+ 1.7	+ 3.0	+ 3.9	+ 4.8	+ 5.4	+ 5.3	+ 5.4	+ 5.4	+ 4.7
11th	+ 4.6	+ 4.7	+ 5.0	+ 5.6	+ 5.6	+ 5.4	+ 5.6	+ 4.6	+ 4.0	+ 2.3	+ 0.8	- 0.7	- 1.9	+ 0.7	+ 2.3	+ 2.9	+ 2.8	+ 2.7	+ 3.5	+ 4.7	+ 4.1	+ 3.7	+ 3.6	+ 3.1
12th	+ 3.1	+ 2.7	+ 2.5	+ 2.8	+ 2.8	+ 3.2	+ 2.1	+ 2.9	+ 1.3	+ 0.1	- 3.1	- 4.0	- 5.3	- 4.7	- 3.8	- 2.7	- 0.3	- 0.4	- 0.9	- 0.9	- 0.5	- 1.0	- 1.6	- 2.1
13th	- 0.6	- 1.6	- 1.0	- 1.2	+ 0.3	+ 0.3	- 0.1	- 0.6	- 0.5	- 1.4	+ 0.1	- 0.2	- 2.2	- 0.1	+ 3.4	+ 4.7	+ 3.1	- 0.2	- 3.6	- 4.4	- 1.6	- 2.8	+ 1.9	- 0.3
14th	- 0.3	0.0	- 0.1	+ 0.1	+ 0.5	- 0.5	- 1.4	- 4.7	- 2.4	- 0.4	+ 1.6	+ 0.2	- 1.9	- 2.4	- 2.5	- 0.5	- 1.3	- 1.0	- 3.5	- 1.2	- 2.1	- 1.2	0.0	+ 0.7
15th	- 0.3	- 0.5	+ 0.3	+ 0.4	+ 1.1	+ 3.2	+ 5.5	-	-	+ 3.1	+ 1.1	+ 2.9	+ 1.2	0.0	+ 0.6	- 0.5	0.0	- 0.7	- 0.5	- 2.5	- 8.7	- 5.7	- 8.9	- 4.0
16th	- 9.0	- 11.2	- 10.8	- 8.9	- 5.0	- 13.5	- 6.4	- 9.2	- 14.0	- 23.2	- 17.2	- 15.6	- 17.1	- 16.1	- 13.6	- 14.0	- 11.7	- 12.0	-	- 9.8	- 8.5	- 7.2	- 3.2	- 2.2
17th	+ 6.2	+ 2.6	- 1.3	+ 0.9	+ 1.2	- 1.3	- 0.2	- 0.1	+ 0.9	+ 1.7	+ 0.3	- 1.0	- 2.2	- 1.5	+ 0.6	+ 0.8	+ 0.9	+ 3.5	+ 4.0	+ 4.3	+ 4.3	+ 3.3	+ 3.0	+ 4.3
18th	+ 4.7	+ 3.8	+ 3.5	+ 4.2	+ 4.6	+ 4.8	+ 5.0	+ 4.1	+ 3.0	+ 0.8	- 1.8	- 2.6	- 1.6	+ 1.3	+ 2.7	+ 3.8	+ 5.0	+ 5.7	+ 6.2	+ 5.6	+ 3.9	+ 3.2	+ 4.3	+ 3.9
19th	+ 4.3	+ 5.3	+ 5.6	+ 5.6	+ 5.9	+ 6.8	+ 6.9	+ 6.0	+ 4.6	+ 2.2	+ 0.8	+ 0.4	+ 0.8	+ 2.2	+ 3.2	+ 4.4	+ 4.7	+ 6.0	+ 6.5	+ 7.4	+ 7.2	+ 7.8	+ 7.8	+ 7.8
20th	+ 9.9	+ 9.4	+ 9.0	+ 6.2	+ 6.9	+ 7.0	+ 8.2	+ 6.9	+ 6.6	+ 3.8	+ 2.2	+ 1.0	- 0.4	+ 1.5	+ 1.8	+ 1.8	+ 3.0	+ 2.7	+ 4.6	+ 4.8	+ 3.6	+ 3.5	+ 1.5	+ 2.8
21st	+ 4.3	+ 4.8	+ 5.9	+ 3.6	+ 2.7	+ 3.2	+ 5.0	+ 3.6	+ 1.1	- 1.5	- 5.6	- 2.5	- 3.7	- 7.0	- 3.3	- 5.7	- 5.0	- 5.4	- 3.3	- 0.7	- 0.8	+ 0.6	- 0.5	+ 1.0
22d	+ 2.9	+ 3.2	+ 0.4	- 0.4	+ 2.8	+ 3.3	+ 1.2	+ 0.4	- 0.6	- 0.3	- 3.5	- 3.6	- 4.0	- 3.5	- 0.8	- 2.3	- 1.8	- 1.4	- 0.1	+ 1.9	+ 0.5	+ 1.6	+ 1.0	+ 1.1
23d	+ 4.6	+ 1.0	+ 2.1	+ 5.9	+ 7.3	+ 3.8	+ 6.0	- 2.9	- 7.0	- 4.0	- 5.7	- 7.5	- 5.8	- 3.0	- 2.4	- 4.1	- 3.9	- 1.6	+ 0.6	- 1.3	- 2.0	+ 1.0	- 2.1	- 2.0
24th	- 0.5	+ 1.8	- 2.4	- 1.8	- 0.3	- 0.7	- 1.0	- 0.9	+ 1.8	+ 0.7	+ 1.2	- 0.4	- 2.2	- 2.5	- 1.4	+ 0.3	- 2.0	- 3.6	- 3.6	- 1.5	- 0.4	- 1.3	+ 0.4	+ 0.8
25th	- 1.2	- 1.3	+ 0.9	- 0.8	- 0.5	- 1.1	- 1.9	- 1.8	- 0.3	+ 1.2	- 1.0	- 4.1	- 5.4	- 2.8	- 1.1	+ 1.4	+ 1.7	+ 2.4	+ 1.7	+ 0.7	+ 2.0	- 2.5	- 1.0	- 0.5
26th	- 0.8	0.0	- 1.3	- 1.8	- 1.5	- 1.3	+ 0.4	+ 0.7	+ 2.1	+ 3.6	+ 3.4	+ 2.2	+ 2.0	+ 1.3	+ 2.1	+ 1.8	+ 2.2	- 0.1	- 0.3	- 2.3	- 4.0	- 0.5	0.0	+ 1.2
27th	+ 0.4	+ 1.3	+ 1.6	+ 2.8	+ 3.2	+ 3.4	+ 3.4	+ 2.0	+ 4.1	+ 5.8	+ 4.4	+ 2.7	+ 1.4	+ 1.9	+ 2.8	+ 2.9	+ 4.2	+ 3.5	+ 4.7	+ 3.1	+ 2.7	+ 3.3	+ 4.8	+ 4.4
28th	+ 4.6	+ 4.0	+ 3.0	+ 3.9	+ 2.9	+ 3.4	+ 3.4	+ 1.3	+ 2.9	+ 3.1	+ 0.8	- 0.1	- 1.0	- 1.2	+ 1.5	+ 3.7	+ 4.3	+ 4.6	+ 5.6	+ 5.6	+ 6.3	+ 6.8	+ 5.1	+ 5.0
29th	+ 4.5	+ 5.0	+ 4.1	+ 2.3	+ 2.7	+ 3.2	+ 3.8	+ 3.9	+ 4.2	+ 4.5	+ 3.1	+ 2.1	+ 3.2	+ 3.1	+ 3.9	+ 3.8	+ 4.6	+ 5.1	+ 5.4	+ 5.8	+ 5.3	+ 4.6	+ 3.7	+ 4.9
30th	+ 4.5	+ 4.1	-	+ 2.4	+ 3.9	+ 3.1	+ 4.2	+ 1.8	+ 1.9	- 3.7	+ 0.3	- 1.3	- 1.5	- 3.1	- 2.5	- 0.7	+ 4.0	+ 5.0	+ 5.2	+ 4.6	+ 4.0	+ 4.9	-	-
Means	+ 3.18	+ 3.04	+ 2.79	+ 2.77	+ 3.36	+ 3.00	+ 3.42	+ 2.11	+ 1.76	+ 0.85	- 0.07	- 1.00	- 1.64	- 0.81	+ 0.53	+ 1.30	+ 2.11	+ 1.98	+ 2.58	+ 2.73	+ 2.57	+ 2.46	+ 2.64	+ 2.79
Normals	+ 3.37	+ 3.32	+ 3.06	+ 3.17	+ 3.65	+ 3.57	+ 3.76	+ 2.81	+ 2.67	+ 1.68	+ 0.74	- 0.24	- 1.11	- 0.40	+ 0.80	+ 2.32	+ 2.90	+ 2.98	+ 3.69	+ 3.43	+ 3.60	+ 3.10	+ 3.26	+ 3.03

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MAY 1861.

Value of a part of division = 0.000193.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 6.1	+ 6.0	+ 6.0	+ 6.6	+ 6.5	+ 6.1	+ 5.9	+ 5.1	+ 3.5	+ 1.5	0.0	- 0.6	- 1.4	- 1.2	- 1.1	+ 0.7	+ 1.9	+ 2.2	+ 2.3	+ 2.7	+ 1.3	+ 0.4	+ 0.1	+ 1.3
2d	+ 2.1	+ 1.9	+ 2.9	+ 3.5	+ 1.9	+ 3.7	+ 4.5	+ 4.6	+ 5.6	+ 5.9	+ 4.7	+ 4.0	+ 2.7	+ 3.1	+ 2.9	+ 3.0	+ 5.2	+ 4.2	+ 5.7	+ 6.6	+ 5.2	+ 5.4	+ 6.3	+ 5.9
3d	+ 5.9	+ 4.4	+ 4.2	+ 5.4	+ 4.8	+ 5.3	+ 5.7	+ 6.4	+ 6.0	+ 7.1	+ 5.2	+ 6.7	+ 1.6	+ 1.2	+ 2.1	+ 1.4	+ 1.9	+ 3.8	+ 3.7	+ 0.5	+ 1.9	+ 3.5	+ 3.9	+ 4.9
4th	+ 5.5	+ 5.6	+ 4.9	+ 3.5	+ 3.2	+ 3.7	+ 3.8	+ 2.7	+ 1.6	+ 1.4	+ 1.8	+ 1.4	- 0.4	+ 1.3	+ 0.9	+ 2.7	+ 4.1	+ 2.1	+ 2.2	+ 1.6	+ 2.6	+ 3.8	+ 4.4	+ 3.7
5th	+ 4.3	+ 4.9	+ 3.3	+ 3.6	- 0.9	- 0.3	- 2.2	-	+ 4.5	+ 5.7	+ 5.5	+ 4.7	+ 4.1	+ 5.8	+ 4.9	+ 4.9	+ 6.6	+ 8.6	+ 5.5	+ 6.7	+ 2.6	+ 2.5	+ 4.7	+ 5.5
6th	+ 4.9	+ 4.2	+ 5.5	+ 7.0	+ 5.5	+ 1.6	-	+ 1.3	+ 4.8	+ 5.6	+ 2.6	+ 1.2	+ 3.1	+ 3.2	+ 3.9	+ 4.5	+ 5.7	+ 5.8	+ 7.1	+ 7.2	+ 7.5	+ 6.1	+ 7.9	+ 8.7
7th	+ 7.4	+ 7.2	+ 7.6	+ 7.9	+ 8.3	+ 8.2	+ 8.5	+ 8.2	+ 7.7	+ 6.4	+ 5.9	+ 4.0	+ 3.6	+ 2.5	+ 2.9	+ 3.4	+ 4.9	+ 5.2	+ 7.0	+ 6.2	+ 6.1	+ 5.9	+ 6.1	+ 8.1
8th	+ 6.9	+ 6.7	+ 6.9	+ 7.4	+ 7.8	+ 7.9	-	+ 8.4	+ 8.7	+ 2.8	+ 5.5	+ 4.3	+ 4.8	+ 4.5	+ 4.9	+ 4.1	+ 5.5	+ 5.2	+ 5.2	+ 7.1	+ 7.5	+ 7.0	+ 3.8	+ 6.2
9th	+ 7.1	+ 5.4	+ 5.8	+ 6.2	+ 8.0	+ 9.0	+ 7.7	+ 8.5	+ 5.4	+ 5.6	-	-	-	- 0.5	- 0.4	+ 1.8	-	+ 4.1	+ 4.0	+ 3.2	+ 4.0	+ 3.6	+ 3.0	+ 2.6
10th	+ 4.3	+ 4.9	+ 3.7	+ 3.2	+ 3.1	+ 3.3	+ 4.3	+ 3.4	+ 4.1	+ 3.9	+ 1.6	- 1.1	+ 0.4	+ 1.1	+ 2.6	+ 3.4	+ 3.6	+ 2.4	+ 3.5	+ 3.0	+ 2.1	+ 3.6	+ 2.5	+ 2.3
11th	+ 3.0	+ 5.3	+ 3.4	+ 2.7	+ 3.8	+ 3.5	+ 3.6	+ 2.9	+ 3.1	+ 2.2	+ 1.0	+ 0.1	+ 0.6	- 2.1	- 2.0	+ 0.9	+ 1.3	- 1.5	0.0	- 0.9	- 0.5	- 0.4	+ 0.9	- 0.8
12th	+ 0.3	+ 0.1	+ 1.9	+ 0.3	+ 0.1	0.0	+ 0.4	+ 0.1	+ 0.4	- 0.2	- 0.4	- 2.6	- 2.8	- 3.8	- 5.9	- 4.6	- 2.5	- 1.0	- 0.3	+ 2.1	+ 3.1	+ 3.8	+ 2.8	+ 4.0
13th	+ 3.2	+ 2.0	+ 1.6	+ 1.9	+ 3.3	+ 4.4	+ 7.3	+ 9.0	+ 8.8	+ 7.6	+ 4.9	+ 4.2	+ 3.3	+ 2.8	+ 2.7	+ 2.0	+ 3.3	+ 4.1	+ 4.6	+ 3.5	+ 1.7	+ 0.3	+ 0.4	+ 2.3
14th	+ 3.2	+ 1.4	+ 1.3	+ 1.1	+ 1.4	+ 1.2	+ 1.5	+ 0.9	+ 0.5	- 0.5	- 1.0	+ 0.4	- 0.1	- 0.0	- 1.6	- 2.0	- 0.5	- 0.8	- 4.0	+ 0.4	+ 1.5	+ 1.9	+ 1.3	+ 1.3
15th	+ 0.1	- 2.7	- 2.5	- 1.8	- 1.5	- 0.3	- 0.3	- 2.5	- 1.4	0.0	+ 2.0	+ 2.7	+ 1.7	+ 1.4	+ 0.6	+ 2.3	+ 3.2	+ 2.3	+ 1.4	+ 1.6	- 0.1	- 0.2	- 0.7	- 0.4
16th	+ 0.5	+ 1.6	+ 2.5	+ 3.0	+ 3.5	+ 3.8	-	+ 3.2	+ 3.0	+ 4.8	+ 6.0	+ 4.5	+ 5.3	+ 4.9	+ 4.5	+ 1.7	+ 3.5	+ 2.6	+ 4.9	+ 1.7	- 3.4	+ 2.0	- 0.3	- 5.8
17th	+ 0.8	- 2.0	- 5.3	- 5.1	- 1.8	- 2.2	- 0.2	+ 0.2	- 8.8	+ 0.9	+ 6.7	- 2.0	- 3.7	- 2.5	- 6.6	- 5.4	- 5.8	- 3.8	- 4.4	- 7.0	- 1.4	- 5.3	- 0.2	- 2.0
18th	- 1.1	- 8.4	- 6.7	- 6.3	- 5.6	+ 0.2	- 0.3	+ 4.4	+ 5.2	+ 0.9	+ 0.1	+ 0.1	- 0.7	- 4.0	- 2.5	- 3.5	+ 2.7	+ 2.6	+ 0.9	- 1.2	- 1.2	- 0.3	- 0.2	+ 1.2
19th	+ 5.1	- 2.1	- 0.8	- 3.2	- 4.3	- 0.8	- 3.4	- 0.7	- 2.3	- 3.5	- 1.4	- 6.7	- 3.4	- 0.2	- 1.5	- 1.1	+ 0.2	- 0.3	+ 1.5	- 1.1	- 3.1	- 2.2	+ 4.6	- 0.9
20th	- 2.2	- 0.9	- 0.8	- 2.0	- 3.0	- 3.9	- 2.9	- 6.0	- 5.1	- 4.8	- 1.2	- 0.4	- 2.8	- 4.9	+ 3.3	+ 2.9	- 5.9	- 6.3	- 5.3	- 4.6	- 4.4	- 5.2	- 2.9	- 1.4
21st	- 2.2	- 4.0	- 4.6	- 5.5	- 6.2	- 6.2	- 5.9	- 6.7	- 3.8	- 1.0	+ 0.8	+ 1.9	+ 1.5	+ 1.0	+ 1.5	+ 2.0	+ 2.0	+ 1.2	+ 0.1	- 1.3	- 2.3	- 3.1	- 3.2	- 2.7
22d	- 3.1	- 0.4	+ 1.1	+ 2.4	+ 2.8	+ 3.5	+ 4.0	+ 3.0	+ 4.2	+ 4.0	+ 4.5	+ 2.8	+ 1.1	+ 0.2	- 0.1	+ 1.2	+ 1.3	+ 1.6	- 0.3	+ 0.5	- 0.3	+ 0.2	0.0	- 0.1
23d	- 0.6	+ 1.3	+ 0.2	0.0	+ 1.3	+ 1.0	+ 1.9	+ 0.4	+ 2.0	+ 4.6	+ 6.9	+ 6.5	+ 5.2	+ 3.3	+ 2.1	+ 1.6	- 0.1	+ 9.2	+ 7.7	- 4.0	- 6.9	- 4.3	- 2.8	+ 0.1
24th	+ 2.6	+ 2.3	+ 3.4	+ 4.2	+ 5.3	+ 5.5	+ 5.7	+ 6.9	+ 6.0	+ 5.7	+ 4.4	+ 3.1	+ 2.4	+ 1.9	+ 2.0	+ 1.3	+ 4.1	+ 5.8	+ 5.0	+ 2.4	+ 2.5	+ 3.9	+ 5.5	+ 5.6
25th	+ 6.2	+ 5.9	+ 6.5	+ 6.3	+ 7.0	+ 10.7	+ 8.4	+ 3.6	+ 8.4	+ 7.6	+ 6.6	+ 6.1	+ 6.1	+ 4.0	+ 3.3	+ 4.1	+ 5.3	+ 6.9	+ 6.2	+ 6.4	+ 6.7	+ 6.5	+ 6.1	+ 4.7
26th	+ 4.3	+ 4.5	+ 4.8	+ 4.5	+ 5.3	+ 6.2	+ 7.1	+ 5.3	+ 4.8	+ 4.1	+ 5.2	+ 2.1	+ 0.3	+ 1.8	+ 1.9	+ 2.9	+ 2.7	+ 2.6	+ 5.8	+ 5.7	+ 5.5	+ 4.5	+ 5.2	+ 4.3
27th	+ 6.8	+ 4.8	+ 5.2	+ 4.5	+ 5.6	+ 6.9	+ 7.3	+ 8.1	+ 8.0	+ 7.3	+ 6.2	+ 4.0	+ 3.7	+ 4.1	+ 5.4	+ 6.4	+ 7.2	+ 8.4	+ 3.6	+ 0.2	- 2.9	- 1.7	- 3.1	- 1.0
28th	- 0.7	+ 0.3	- 0.8	+ 0.3	+ 1.5	+ 1.9	+ 1.1	+ 0.8	+ 0.1	- 0.1	+ 1.6	+ 2.8	+ 3.9	+ 3.7	+ 2.5	+ 1.3	+ 1.4	+ 3.4	+ 3.8	+ 4.6	+ 3.2	+ 4.6	+ 1.5	+ 2.0
29th	+ 4.3	+ 4.8	+ 4.9	+ 4.4	+ 3.1	+ 4.3	+ 8.1	+ 3.7	+ 4.7	+ 7.1	+ 6.8	+ 6.2	+ 5.3	+ 5.1	+ 2.3	+ 1.7	+ 3.2	+ 3.4	+ 5.2	+ 5.6	+ 3.4	+ 4.2	+ 3.1	+ 2.1
30th	+ 1.2	+ 0.7	+ 0.6	- 0.3	- 1.2	- 2.9	- 2.4	- 0.6	- 2.4	- 0.6	-	+ 3.9	-	-	+ 1.3	-	-	-	+ 6.0	+ 5.8	+ 5.6	+ 5.1	+ 4.4	+ 2.4
31st	+ 1.7	+ 0.2	+ 0.9	+ 0.9	+ 2.2	+ 3.1	+ 2.7	+ 2.5	+ 2.1	+ 2.9	+ 3.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Means	+ 2.84	+ 2.13	+ 2.18	+ 2.15	+ 2.28	+ 2.85	+ 2.93	+ 2.90	+ 2.88	+ 2.88	+ 3.32	+ 1.76	+ 1.62	+ 1.28	+ 1.23	+ 1.57	+ 2.36	+ 2.92	+ 2.95	+ 2.17	+ 1.58	+ 1.87	+ 2.17	+ 2.05
Normals	+ 2.84	+ 2.70	+ 3.01	+ 3.21	+ 3.10	+ 3.14	+ 3.76	+ 3.56	+ 4.30	+ 3.59	+ 3.32	+ 2.38	+ 1.62	+ 1.50	+ 1.76	+ 2.06	+ 2.99	+ 3.29	+ 3.79	+ 2.99	+ 2.10	+ 2.63	+ 2.17	+ 2.09

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JUNE 1861.

Value of a part of division = 0.000184.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3d	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5th	— 3·8	— 3·8	— 2·7	— 1·3	— 0·4	— 0·5	— 0·5	— 0·1	+ 1·1	— 5·2	—	—	—	— 13·6	— 13·1	— 11·6	— 9·4	— 8·1	— 10·7	— 6·8	— 7·8	— 8·1	— 8·5	— 8·1
6th	— 7·4	— 6·6	— 6·1	— 4·9	— 4·4	— 4·2	— 3·5	— 2·8	— 1·4	— 0·9	—	— 13·1	—	— 12·1	— 11·3	—	—	— 14·7	— 14·3	— 14·3	— 15·5	— 15·4	— 13·5	— 14·0
7th	— 24·2	— 22·7	— 21·9	— 21·5	— 20·8	—	—	— 17·3	— 14·9	— 16·0	— 18·1	— 19·9	— 22·3	— 23·7	— 26·5	— 24·2	— 21·6	—	— 20·2	— 19·7	— 20·9	— 19·6	— 18·7	— 18·7
8th	— 18·2	— 18·6	— 18·0	— 17·6	— 15·7	— 16·5	— 17·3	— 14·0	— 13·7	— 15·1	— 16·7	— 20·4	— 23·4	— 23·3	— 25·2	— 23·3	— 20·6	— 19·1	— 20·0	— 20·5	— 20·3	— 19·6	— 18·6	— 18·1
9th	— 17·6	— 16·2	— 16·1	— 15·6	— 16·2	— 15·6	— 14·8	— 13·8	— 13·9	— 16·5	— 15·5	— 16·4	— 18·6	— 19·9	— 19·2	— 18·1	— 14·7	— 15·6	— 13·6	— 12·5	— 12·5	— 12·4	— 12·6	— 12·4
10th	— 12·3	— 11·8	— 11·0	— 10·0	— 8·8	—	— 6·9	— 5·6	— 5·9	— 6·9	— 8·2	— 9·7	— 9·4	— 9·9	— 10·0	— 9·0	— 5·8	— 3·9	— 3·5	— 3·1	— 3·0	— 1·7	— 0·7	+ 0·4
11th	+ 0·6	+ 1·0	+ 1·3	+ 2·3	+ 2·5	+ 3·1	+ 3·3	+ 4·2	+ 4·3	+ 4·1	+ 2·9	+ 0·6	— 0·5	+ 0·2	+ 1·0	+ 3·0	+ 4·6	+ 5·6	+ 6·3	+ 7·4	+ 7·6	+ 7·8	+ 9·2	+ 7·8
12th	+ 8·2	+ 10·2	+ 10·2	+ 9·1	+ 11·7	+ 11·9	+ 11·4	+ 12·1	+ 10·5	+ 12·0	+ 10·7	+ 8·1	+ 8·1	+ 7·0	+ 1·3	+ 3·6	+ 6·6	+ 8·3	+ 9·5	+ 8·6	+ 4·2	+ 2·5	+ 2·4	+ 4·6
13th	+ 5·2	+ 8·0	+ 7·0	+ 7·6	+ 7·5	+ 5·3	+ 15·3	+ 10·2	+ 7·7	+ 3·5	+ 1·3	+ 2·1	— 6·9	— 1·9	— 1·8	— 3·0	— 4·4	— 1·8	+ 0·2	+ 1·4	0·0	— 1·2	+ 0·6	+ 8·4
14th	— 1·9	— 0·5	+ 1·1	+ 4·0	+ 3·0	+ 3·2	+ 4·1	+ 2·9	+ 2·9	+ 0·7	+ 0·3	+ 2·5	—	— 4·7	— 3·1	— 2·8	— 0·8	+ 1·3	+ 3·3	+ 2·9	+ 5·2	+ 3·9	+ 4·8	+ 4·9
15th	+ 6·4	+ 7·1	+ 6·2	+ 8·6	+ 7·5	+ 7·4	+ 6·3	+ 7·7	+ 8·3	+ 8·2	+ 5·7	+ 2·4	+ 1·0	— 2·2	— 3·0	+ 1·1	+ 2·7	+ 3·8	+ 4·6	+ 5·1	+ 3·7	+ 4·9	+ 6·1	+ 7·5
16th	+ 6·3	+ 9·2	+ 8·1	+ 5·8	+ 6·6	+ 6·4	+ 4·8	+ 6·3	+ 4·9	+ 6·7	+ 6·2	+ 2·5	— 6·8	— 2·7	+ 0·4	+ 0·6	+ 2·3	+ 3·6	+ 3·0	+ 4·8	+ 4·7	+ 5·8	+ 4·4	+ 5·7
17th	+ 4·2	+ 4·7	+ 5·1	+ 5·6	+ 6·1	+ 6·1	+ 5·6	+ 7·7	+ 5·2	+ 3·8	+ 1·8	+ 0·1	— 1·5	— 1·5	+ 0·2	+ 3·3	+ 5·0	+ 4·8	+ 5·2	+ 5·0	+ 8·6	+ 6·8	+ 6·7	+ 7·7
18th	+ 7·3	+ 7·2	+ 9·5	+ 9·9	+ 9·5	+ 9·0	+ 9·2	+ 8·6	+ 10·0	+ 11·2	+ 10·1	+ 7·7	+ 7·2	+ 5·7	+ 4·7	+ 5·9	+ 4·9	+ 7·2	+ 6·3	+ 8·5	+ 9·0	+ 10·5	+ 10·8	+ 10·1
19th	+ 10·6	+ 11·2	+ 11·7	+ 11·9	+ 12·5	+ 12·7	+ 12·9	+ 13·5	+ 13·9	+ 12·9	+ 10·9	+ 8·6	+ 6·9	+ 5·7	+ 6·5	+ 8·5	+ 10·5	+ 6·2	+ 11·2	+ 10·5	+ 10·4	+ 11·5	+ 9·4	+ 9·7
20th	+ 9·4	+ 12·8	+ 10·9	+ 11·2	+ 10·8	+ 11·3	+ 11·8	+ 11·2	+ 12·5	+ 11·2	+ 8·9	+ 7·5	+ 7·1	+ 6·4	+ 7·1	+ 8·2	+ 11·7	+ 10·8	+ 9·7	+ 10·8	+ 6·9	+ 8·3	+ 9·7	+ 9·6
21st	+ 9·7	+ 9·2	+ 8·5	+ 9·6	+ 9·6	+ 10·3	+ 11·1	+ 10·8	+ 11·0	+ 10·3	+ 7·4	+ 6·2	+ 6·0	+ 2·9	+ 4·1	+ 5·0	+ 5·0	+ 6·3	+ 6·3	+ 8·0	+ 6·1	+ 9·1	+ 7·4	+ 7·9
22d	+ 6·3	+ 5·8	+ 6·4	+ 6·0	+ 5·9	+ 9·0	+ 8·4	+ 7·9	— 0·1	+ 8·6	+ 6·8	+ 3·9	+ 2·6	+ 2·9	+ 2·7	+ 2·4	+ 4·1	+ 3·9	+ 4·9	+ 3·9	+ 3·7	+ 3·1	+ 3·5	+ 4·8
23d	+ 4·9	+ 5·2	+ 5·9	+ 9·0	+ 10·1	+ 7·0	+ 6·7	+ 8·0	+ 6·3	+ 5·5	+ 5·3	+ 3·5	+ 2·3	+ 2·5	+ 0·7	+ 0·6	+ 3·1	+ 1·7	+ 1·9	+ 3·2	+ 4·2	+ 2·8	+ 3·8	+ 4·5
24th	+ 4·0	+ 3·0	+ 5·8	+ 5·3	+ 4·8	+ 5·8	+ 6·2	+ 8·7	+ 8·7	+ 8·4	+ 7·4	+ 4·7	+ 2·2	+ 1·4	+ 1·2	+ 2·3	+ 4·2	+ 5·8	+ 5·3	+ 6·4	+ 6·9	+ 6·7	+ 6·1	+ 5·4
25th	+ 5·2	+ 6·0	+ 5·7	+ 4·9	+ 5·0	+ 6·9	+ 6·1	+ 5·9	+ 8·0	+ 7·9	+ 0·2	+ 5·8	+ 6·0	+ 4·8	+ 2·8	+ 4·0	+ 5·1	+ 5·1	+ 5·5	+ 3·7	+ 5·7	+ 6·5	+ 5·4	+ 6·0
26th	+ 4·9	+ 4·8	+ 5·2	+ 4·8	+ 6·2	+ 6·5	+ 4·8	+ 6·4	+ 7·1	+ 6·7	+ 4·2	+ 0·4	+ 1·4	— 0·8	— 0·2	+ 1·6	+ 2·6	+ 2·8	+ 0·8	+ 0·2	— 1·4	— 0·2	+ 0·6	+ 2·8
27th	+ 2·5	+ 3·7	+ 2·7	+ 4·1	+ 3·6	+ 3·5	+ 4·0	+ 4·3	+ 2·4	+ 2·2	+ 1·5	— 0·5	— 0·1	+ 0·6	— 2·2	— 3·9	— 0·6	0·0	+ 2·0	+ 1·9	+ 1·7	+ 1·7	+ 1·3	+ 0·8
28th	+ 0·7	+ 0·4	+ 0·2	+ 1·5	+ 0·3	+ 0·4	+ 0·9	+ 1·6	+ 2·6	+ 3·4	+ 2·2	0·0	— 1·4	— 1·3	— 1·9	— 1·8	— 1·2	— 0·1	+ 0·9	+ 1·1	— 2·2	— 3·4	+ 1·1	+ 1·4
29th	+ 4·9	+ 3·1	+ 1·9	+ 2·9	+ 3·5	+ 4·5	+ 4·6	+ 4·9	+ 5·8	+ 4·7	+ 4·2	+ 1·3	— 1·0	— 2·6	— 4·7	— 1·8	+ 0·9	+ 1·1	— 0·1	+ 2·4	+ 3·0	+ 3·1	+ 3·1	+ 3·5
30th	+ 2·8	+ 4·2	+ 3·6	+ 3·5	+ 3·8	+ 3·8	+ 3·6	+ 4·5	+ 5·3	+ 5·9	+ 4·7	+ 2·2	+ 0·2	— 1·5	— 1·5	— 0·3	+ 1·1	+ 4·0	+ 3·9	+ 4·8	+ 4·5	+ 3·6	+ 1·0	+ 1·2
Means	+ 0·72	+ 1·41	+ 1·58	+ 2·07	+ 2·47	+ 4·05	+ 3·92	+ 3·58	+ 3·47	+ 2·92	+ 1·90	— 0·29	— 1·78	— 3·14	— 3·50	— 2·27	— 0·47	+ 0·55	+ 0·32	+ 0·69	+ 0·33	+ 0·48	+ 0·75	+ 1·50
Normals	+ 3·80	+ 3·98	+ 3·69	+ 3·86	+ 4·39	+ 5·43	+ 4·88	+ 5·59	+ 4·65	+ 4·96	+ 3·88	+ 2·10	— 0·65	— 0·58	0·51	+ 0·56	+ 2·27	+ 3·18	+ 3·55	+ 2·91	+ 2·29	+ 2·81	+ 3·14	+ 4·49

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JULY 1861.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.5	+ 3.6	+ 3.4	+ 4.3	+ 5.2	+ 5.7	+ 5.8	+ 6.4	+ 5.3	+ 8.0	+ 6.7	+ 4.8	+ 1.7	- 2.2	- 1.1	+ 2.7	+ 3.6	+ 5.5	+ 3.7	+ 4.1	+ 2.5	+ 3.5	+ 3.7	+ 3.4
2d	+ 5.7	+ 3.6	+ 8.3	+ 3.0	+ 3.8	+ 4.6	+ 6.2	+ 5.9	+ 7.7	+ 7.6	+ 5.8	+ 4.1	+ 2.3	+ 1.0	+ 1.8	+ 3.4	+ 5.1	+ 6.1	+ 6.5	+ 7.0	+ 6.6	+ 5.1	+ 5.9	+ 5.8
3d	+ 6.3	+ 5.7	+ 5.4	+ 6.4	+ 3.8	+ 7.0	+ 7.3	+ 6.6	+ 7.9	+ 7.3	+ 5.4	+ 3.4	+ 2.0	+ 1.4	+ 0.9	+ 2.6	+ 4.5	+ 5.8	+ 6.2	+ 6.2	+ 6.2	+ 6.4	+ 5.9	+ 7.8
4th	+ 4.8	+ 5.2	+ 5.1	+ 6.0	+ 6.3	+ 6.1	+ 5.9	+ 5.6	+ 8.1	+ 8.9	+ 7.1	+ 5.2	+ 3.0	+ 3.1	+ 2.5	+ 3.1	+ 1.9	+ 1.9	+ 2.4	+ 2.2	+ 0.6	+ 0.5	+ 5.0	+ 3.8
5th	+ 3.4	+ 3.4	+ 3.5	+ 5.5	+ 5.3	+ 4.9	+ 4.3	+ 4.7	+ 8.2	+ 5.3	+ 3.3	+ 0.7	- 0.7	- 1.1	+ 0.5	+ 2.6	+ 4.5	+ 5.0	+ 5.0	+ 5.0	+ 2.9	+ 2.3	+ 3.6	+ 4.6
6th	+ 5.1	+ 5.0	+ 5.3	+ 5.9	+ 6.4	+ 6.0	+ 6.2	+ 7.2	+ 8.1	+ 6.3	+ 5.5	+ 3.8	+ 1.2	- 0.1	- 0.2	+ 1.0	+ 2.9	+ 3.9	+ 5.1	+ 5.0	+ 5.1	+ 4.9	+ 4.9	+ 5.6
7th	+ 5.8	+ 6.1	+ 5.9	+ 6.0	+ 6.0	+ 6.2	+ 6.1	+ 6.6	+ 8.1	+ 6.6	+ 3.5	0.0	- 2.9	- 4.0	- 1.7	+ 1.2	+ 2.9	+ 4.1	+ 4.3	+ 5.1	+ 5.0	+ 5.2	+ 5.4	+ 5.8
8th	+ 6.2	+ 5.9	+ 5.5	+ 5.1	+ 4.6	+ 5.5	+ 6.6	+ 7.1	+ 8.4	-	-	-	-	-	-	-	-	-	+ 3.7	+ 4.0	+ 4.3	+ 3.6	+ 3.8	+ 4.0
9th	+ 4.3	+ 4.8	+ 5.1	+ 5.8	+ 6.0	+ 6.7	+ 7.6	+ 7.7	+ 10.2	+ 10.2	-	-	-	-	+ 4.9	-	-	-	+ 3.4	+ 0.1	+ 5.1	+ 2.0	+ 5.9	+ 6.0
10th	- 2.6	+ 1.3	+ 1.9	+ 2.4	+ 2.1	+ 4.3	+ 3.7	+ 3.5	+ 3.2	+ 3.3	+ 2.1	- 0.3	- 1.3	- 2.6	- 2.9	- 1.6	+ 1.5	+ 3.4	+ 1.9	- 0.1	+ 0.8	+ 1.7	+ 3.4	+ 3.4
11th	+ 3.1	-	+ 2.4	+ 2.8	+ 6.1	+ 0.4	+ 3.4	+ 5.2	-	+ 3.1	- 1.1	- 4.3	- 4.0	- 3.9	- 4.1	- 1.2	- 5.6	- 1.8	- 3.0	- 1.1	- 1.1	- 4.1	- 2.3	+ 3.9
12th	- 0.7	- 1.1	+ 0.9	+ 0.7	+ 0.7	+ 1.9	+ 1.6	+ 1.7	+ 3.1	+ 3.6	+ 2.4	- 1.0	+ 0.4	- 2.4	- 3.7	- 1.5	- 4.5	- 5.1	- 0.9	+ 1.0	+ 1.1	+ 0.7	- 1.0	+ 1.6
13th	+ 1.8	+ 2.2	+ 2.0	+ 3.5	+ 1.8	+ 2.1	+ 2.7	+ 5.0	+ 4.6	+ 0.7	+ 3.8	- 1.3	-	-	- 5.0	- 4.2	-	-	+ 1.1	+ 2.5	0.0	+ 0.3	+ 0.8	+ 1.8
14th	+ 1.6	+ 1.6	+ 2.2	+ 1.6	+ 2.5	+ 2.7	+ 3.2	+ 1.8	+ 3.2	+ 4.0	+ 3.0	- 0.1	- 1.4	- 4.1	- 1.2	- 0.8	+ 1.2	+ 1.5	+ 1.6	+ 0.8	- 0.1	+ 1.3	+ 2.2	+ 3.3
15th	+ 4.1	+ 2.6	+ 2.2	+ 2.8	+ 3.5	+ 8.5	+ 7.9	+ 5.5	+ 5.8	+ 0.6	- 2.3	- 3.1	- 4.3	- 3.5	- 3.2	- 2.7	- 1.3	- 1.6	+ 0.6	+ 1.3	+ 1.9	+ 2.1	+ 2.2	+ 1.8
16th	+ 2.5	+ 1.7	+ 2.0	+ 2.0	+ 4.4	+ 3.8	+ 3.5	+ 4.3	+ 5.3	+ 5.9	+ 4.6	+ 1.5	- 2.1	- 4.3	- 3.9	- 4.6	- 2.4	+ 0.1	+ 2.3	+ 2.2	+ 1.9	+ 2.8	+ 3.6	+ 3.7
17th	+ 4.2	+ 5.4	+ 5.0	+ 3.7	+ 3.7	+ 4.4	+ 5.0	+ 5.7	+ 5.0	+ 6.9	+ 6.6	+ 3.0	+ 1.4	- 1.3	- 1.7	- 1.0	+ 0.5	+ 1.3	+ 0.8	+ 1.5	+ 2.1	+ 0.6	+ 1.3	+ 2.1
18th	+ 2.7	+ 3.0	+ 3.8	+ 3.3	+ 3.6	+ 3.1	+ 2.4	+ 4.0	+ 5.9	+ 4.1	+ 0.2	+ 1.1	+ 0.1	0.0	- 1.7	+ 0.4	+ 1.7	+ 3.3	+ 3.1	+ 2.5	+ 3.8	+ 6.7	+ 6.1	+ 6.0
19th	+ 6.2	+ 5.2	+ 6.2	+ 6.5	+ 7.5	+ 7.0	+ 7.4	+ 8.4	+ 8.2	+ 10.3	+ 8.3	+ 6.1	-	-	- 9.0	-	+ 1.4	-	+ 3.6	+ 3.4	+ 3.8	+ 4.3	+ 5.4	+ 5.5
20th	+ 5.8	+ 5.9	+ 5.3	+ 7.3	+ 6.6	+ 6.2	+ 6.0	+ 5.2	+ 6.0	+ 8.4	+ 7.0	+ 5.1	+ 2.7	+ 1.0	+ 0.7	+ 3.6	+ 5.8	+ 7.4	+ 7.0	+ 7.4	+ 7.0	+ 6.2	+ 5.9	+ 4.5
21st	+ 4.1	+ 3.3	+ 7.5	+ 4.6	+ 5.9	+ 5.7	+ 4.9	+ 7.9	+ 8.2	+ 6.3	+ 4.2	+ 2.2	+ 1.1	- 1.7	- 5.2	- 0.1	+ 1.6	- 0.8	- 0.8	+ 1.3	- 4.7	- 2.9	0.0	+ 2.3
22d	+ 0.7	+ 2.6	+ 2.9	+ 2.7	+ 2.8	+ 3.9	+ 3.8	+ 4.4	- 4.8	+ 4.6	+ 1.9	+ 0.2	- 1.9	- 2.1	- 0.3	+ 2.4	+ 4.7	+ 5.4	+ 3.8	+ 3.1	+ 1.8	+ 6.4	+ 3.8	+ 4.2
23d	+ 5.3	+ 5.4	+ 4.3	+ 4.3	+ 3.5	+ 5.7	+ 6.1	+ 6.8	+ 7.8	+ 7.2	+ 6.5	+ 4.2	+ 3.4	+ 3.2	+ 1.9	-	+ 4.2	+ 5.6	+ 5.5	+ 4.7	+ 3.5	+ 3.3	+ 4.4	+ 4.7
24th	+ 5.2	+ 6.3	+ 6.4	+ 6.8	+ 7.0	+ 7.3	+ 7.5	+ 8.0	+ 10.0	+ 9.1	+ 7.6	+ 4.7	-	-	- 1.9	-	+ 1.7	-	-	+ 3.1	+ 2.3	+ 2.6	+ 3.1	+ 3.8
25th	+ 4.9	+ 3.4	+ 4.2	+ 4.5	+ 4.9	+ 4.1	+ 3.2	+ 4.1	+ 5.3	+ 5.9	+ 2.3	+ 1.3	- 1.7	- 3.1	- 8.0	-	- 2.4	-	-	-	-	-	-	-
26th	-	-	-	-	-	-	-	-	-	+ 5.8	+ 4.9	+ 2.1	- 2.0	- 3.3	- 4.5	- 3.4	- 3.8	+ 2.6	+ 1.3	+ 3.4	+ 0.5	+ 0.7	+ 3.3	+ 3.9
27th	+ 6.3	+ 4.6	+ 3.8	+ 4.9	+ 4.5	+ 5.6	+ 6.7	+ 5.8	+ 9.0	+ 9.6	+ 5.5	+ 3.8	+ 0.7	- 1.1	- 2.8	+ 9.8	-	- 2.3	- 0.7	+ 0.5	+ 4.5	+ 4.7	+ 4.1	- 5.3
28th	+ 5.0	+ 5.9	+ 5.1	+ 4.9	+ 4.9	+ 4.7	+ 4.8	+ 4.6	+ 4.8	+ 6.3	-	+ 1.0	- 0.8	- 1.0	- 1.7	+ 1.4	+ 1.4	+ 2.4	+ 3.9	+ 4.2	+ 3.8	+ 4.9	+ 4.8	+ 5.7
29th	+ 5.0	+ 5.9	+ 5.0	+ 5.7	+ 5.9	+ 6.3	+ 7.3	+ 6.8	+ 7.8	+ 8.0	+ 6.3	+ 5.8	+ 4.1	+ 1.9	- 0.8	- 1.0	- 0.2	+ 3.1	+ 4.2	+ 5.1	+ 5.1	+ 4.7	+ 5.2	+ 5.1
30th	+ 5.2	+ 5.2	+ 5.4	+ 6.5	+ 4.9	+ 5.2	+ 6.2	+ 6.6	+ 8.7	+ 8.0	+ 6.3	+ 4.3	+ 1.0	- 0.8	- 1.6	- 1.7	+ 1.4	- 6.3	-	+ 4.4	+ 4.8	+ 4.8	+ 4.3	+ 4.3
31st	+ 5.0	+ 5.2	+ 5.2	+ 5.2	+ 5.7	+ 6.3	+ 6.3	+ 7.3	+ 7.1	+ 8.8	+ 7.5	+ 4.7	+ 1.9	+ 0.2	- 0.2	+ 2.4	+ 3.6	+ 5.4	+ 6.0	+ 6.3	+ 7.1	+ 7.4	+ 7.5	+ 7.4
Means	+ 3.95	+ 4.10	+ 4.37	+ 4.49	+ 4.42	+ 5.06	+ 5.32	+ 5.68	+ 6.42	+ 6.37	+ 4.46	+ 2.17	+ 0.15	- 1.18	- 1.76	+ 0.40	+ 1.33	+ 2.01	+ 2.91	+ 3.21	+ 2.90	+ 3.36	+ 3.35	+ 3.46
Normals	+ 4.18	+ 4.10	+ 4.37	+ 4.49	+ 4.70	+ 5.06	+ 5.32	+ 5.68	+ 6.82	+ 6.37	+ 4.71	+ 2.40	+ 0.15	- 1.18	- 1.74	+ 0.01	+ 1.60	+ 2.68	+ 2.91	+ 3.21	+ 3.16	+ 3.36	+ 3.67	+ 4.11

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF AUGUST 1861.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 7.1	+ 7.2	+ 7.1	+ 7.6	+ 7.8	+ 8.1	+ 8.0	+ 7.3	+ 9.2	+ 9.1	+ 7.5	+ 4.7	+ 3.2	+ 1.9	+ 1.6	+ 2.3	+ 3.7	+ 5.2	+ 6.2	+ 6.8	+ 6.9	+ 6.9	+ 6.8	+ 6.8
2d	+ 8.2	+ 6.0	+ 5.9	+ 4.7	+ 4.9	+ 7.0	+ 9.9	+ 6.5	+ 9.6	+ 9.1	+ 7.7	+ 3.5	+ 0.9	+ 0.4	+ 0.2	+ 0.1	+ 1.4	+ 4.0	+ 4.9	+ 4.1	+ 4.4	+ 3.8	+ 3.5	- 2.2
3d	+ 2.8	+ 5.2	+ 5.0	+ 5.7	+ 11.5	+ 4.7	+ 2.9	+ 4.2	+ 2.1	+ 1.4	+ 0.4	- 1.9	+ 1.6	- 0.4	- 5.4	- 5.1	- 2.5	- 0.2	+ 1.4	+ 2.9	+ 2.8	+ 3.7	+ 3.6	+ 4.6
4th	+ 5.4	+ 5.7	+ 5.0	+ 5.3	+ 5.5	+ 6.3	+ 6.5	+ 7.8	+ 8.0	+ 6.7	+ 7.2	+ 4.9	+ 3.0	+ 2.9	+ 0.6	+ 3.2	+ 2.8	+ 5.3	+ 5.1	+ 5.8	+ 5.4	+ 3.8	+ 3.7	+ 3.0
5th	+ 2.8	+ 3.7	+ 4.5	+ 6.2	+ 5.8	+ 5.9	+ 6.8	+ 8.7	+ 9.9	+ 8.3	+ 8.9	+ 6.1	+ 2.6	- 0.5	- 2.8	- 2.5	- 1.3	- 1.3	0.0	+ 1.6	+ 2.9	+ 4.8	+ 2.7	+ 2.4
6th	+ 3.6	+ 3.7	+ 3.6	+ 3.9	+ 4.3	+ 4.9	+ 5.3	+ 6.6	+ 8.3	+ 8.3	+ 7.3	+ 6.9	+ 5.0	+ 5.6	+ 2.7	+ 2.7	+ 7.0	+ 2.8	- 2.1	- 1.8	- 7.2	- 2.4	- 7.7	- 2.5
7th	- 1.8	- 0.4	+ 1.0	+ 2.7	+ 2.9	+ 3.0	+ 4.3	+ 4.2	+ 6.0	+ 6.1	+ 5.1	+ 3.5	+ 1.7	+ 0.3	- 0.9	- 1.8	- 1.1	+ 0.9	+ 2.0	+ 1.8	+ 1.8	+ 3.0	+ 4.4	+ 4.1
8th	+ 3.9	+ 3.6	+ 4.5	+ 5.5	+ 6.0	+ 6.5	+ 7.1	+ 7.3	+ 7.5	+ 5.4	+ 4.5	+ 4.7	+ 2.6	- 1.1	- 3.9	- 5.5	- 3.6	+ 1.1	+ 3.1	+ 3.3	+ 3.3	- 5.3	- 4.8	- 4.9
9th	+ 4.1	+ 7.5	+ 4.7	+ 5.5	+ 6.0	+ 6.7	+ 7.1	+ 8.4	+ 8.1	+ 6.3	+ 2.4	- 0.8	+ 0.2	- 0.2	- 2.2	- 2.4	- 0.1	+ 1.9	+ 2.7	+ 2.5	+ 2.4	+ 2.7	+ 2.7	+ 3.1
10th	+ 3.9	+ 3.7	+ 3.9	+ 3.9	+ 4.8	+ 4.8	+ 5.0	+ 6.1	+ 6.8	+ 5.6	+ 4.4	+ 2.5	+ 1.2	- 2.3	- 4.3	- 6.0	- 4.7	+ 4.6	- 3.3	+ 0.2	+ 0.9	+ 1.4	+ 1.3	+ 0.3
11th	+ 4.5	- 11.4	+ 1.0	+ 1.4	+ 2.2	-	+ 5.2	+ 5.9	+ 6.4	+ 6.8	+ 5.0	+ 3.5	+ 0.9	+ 0.0	- 0.8	- 1.7	- 1.0	- 1.2	- 0.5	- 0.7	- 0.5	+ 0.8	+ 3.8	+ 3.4
12th	+ 5.8	+ 3.9	+ 2.5	+ 3.3	+ 6.3	+ 2.5	+ 3.4	+ 4.2	+ 6.1	+ 6.1	+ 3.1	+ 0.8	- 1.2	- 0.2	+ 1.0	+ 0.9	+ 0.8	+ 0.9	+ 1.1	- 5.9	+ 4.3	- 4.4	+ 4.1	+ 4.3
13th	+ 3.4	+ 4.4	+ 4.4	+ 4.6	+ 5.2	+ 5.5	+ 5.2	+ 6.1	+ 6.3	+ 6.3	+ 4.5	+ 2.6	- 0.1	- 0.7	+ 0.2	+ 0.2	+ 2.0	+ 3.9	+ 4.1	+ 4.0	+ 4.5	+ 4.3	+ 4.5	+ 4.6
14th	+ 4.8	+ 5.5	+ 5.8	+ 5.9	+ 6.4	+ 6.5	+ 6.3	+ 7.4	+ 8.0	+ 7.0	+ 5.3	+ 2.9	+ 0.9	+ 0.9	+ 0.8	+ 2.6	+ 4.1	+ 3.9	-	+ 1.0	0.0	- 0.4	+ 1.4	+ 3.6
15th	+ 8.8	+ 3.2	+ 4.7	+ 7.8	+ 2.7	+ 4.7	+ 5.5	+ 5.6	+ 6.6	+ 7.7	+ 0.5	+ 2.9	+ 3.0	+ 0.1	- 3.4	- 2.2	- 4.3	- 1.5	- 1.2	+ 0.4	+ 0.2	+ 1.5	- 1.2	+ 5.5
16th	+ 1.2	+ 1.5	+ 1.8	+ 3.2	+ 3.0	+ 2.9	+ 3.6	+ 4.1	+ 4.7	+ 4.5	+ 2.8	- 10.0	- 1.0	- 5.2	- 2.4	- 3.5	- 3.1	+ 4.9	-	- 2.9	- 1.5	+ 1.0	+ 2.2	+ 2.9
17th	+ 3.9	+ 4.5	+ 5.2	+ 4.0	+ 2.9	+ 3.8	+ 4.8	+ 6.1	+ 7.5	+ 6.5	+ 4.6	+ 3.1	- 0.2	+ 4.2	- 2.4	- 2.1	- 3.6	0.0	+ 2.0	- 1.2	- 0.7	+ 2.0	+ 8.1	+ 1.4
18th	+ 2.5	+ 1.5	- 0.8	+ 2.0	+ 2.1	+ 2.7	+ 3.4	+ 4.0	+ 5.0	+ 4.7	+ 2.8	- 0.4	+ 1.4	- 3.9	- 5.3	- 6.2	- 6.0	- 7.0	- 5.0	- 11.2	- 9.5	- 7.5	- 12.8	- 12.8
19th	- 13.5	- 18.6	- 10.0	- 6.2	- 3.1	- 2.4	- 1.4	- 2.6	+ 0.8	- 3.3	- 6.6	- 9.8	- 16.3	- 7.7	- 4.9	- 10.6	- 11.8	- 11.7	- 9.1	- 7.4	- 6.0	- 6.1	+ 2.5	- 2.3
20th	- 10.6	- 8.4	- 0.6	- 8.0	- 4.5	- 2.5	- 4.1	- 2.1	- 1.3	+ 0.7	+ 1.4	- 0.8	- 4.9	- 8.5	- 7.7	- 10.5	- 8.5	- 5.0	- 1.4	- 3.4	- 1.2	- 0.5	+ 3.8	+ 0.6
21st	+ 0.6	+ 2.2	+ 1.8	+ 2.7	+ 3.3	+ 2.6	+ 2.7	+ 5.2	+ 6.6	+ 6.6	+ 4.6	+ 2.4	- 1.6	- 2.2	- 2.3	- 2.5	- 1.2	+ 1.7	+ 1.0	+ 0.8	+ 3.1	+ 1.9	+ 0.6	+ 2.8
22d	+ 1.1	+ 1.3	+ 1.1	+ 2.2	+ 2.2	+ 3.1	+ 3.8	+ 5.6	+ 5.5	+ 5.3	+ 4.1	+ 1.2	- 3.7	- 4.7	- 4.4	- 4.4	- 4.0	+ 0.4	+ 0.5	+ 3.3	+ 3.8	+ 1.7	+ 1.6	- 0.7
23d	+ 2.4	+ 2.5	+ 4.0	+ 5.7	+ 8.1	+ 4.4	+ 7.9	+ 7.6	+ 8.7	+ 7.7	+ 5.4	+ 2.1	- 1.2	- 5.3	- 5.2	- 2.3	+ 2.0	+ 3.8	+ 3.5	+ 4.8	+ 4.2	+ 4.7	+ 5.4	+ 8.2
24th	+ 3.9	+ 4.5	+ 5.6	+ 5.9	+ 6.0	+ 5.7	+ 7.1	+ 8.2	+ 8.0	+ 10.0	+ 8.6	+ 6.0	+ 0.7	- 0.2	+ 2.5	+ 3.6	+ 1.1	+ 1.0	+ 4.3	+ 6.5	+ 6.9	+ 6.9	+ 6.4	+ 5.1
25th	+ 7.1	+ 5.7	+ 6.6	+ 6.2	+ 6.4	+ 6.1	+ 6.0	+ 8.7	+ 9.7	+ 10.4	+ 11.6	+ 8.9	+ 5.1	+ 1.8	+ 9.9	+ 11.6	+ 1.2	+ 4.4	+ 4.0	+ 5.0	+ 5.5	+ 6.3	+ 6.4	+ 7.4
26th	+ 5.3	+ 7.7	+ 8.5	+ 7.8	+ 7.9	+ 8.8	+ 9.2	+ 10.1	+ 12.3	+ 13.0	+ 11.3	+ 7.7	+ 4.2	+ 1.2	+ 2.9	+ 3.6	+ 3.4	+ 4.3	+ 5.7	+ 7.2	+ 7.4	+ 8.3	+ 9.3	+ 7.8
27th	+ 7.8	+ 7.8	+ 8.1	+ 9.9	+ 9.3	+ 9.1	+ 9.9	+ 11.2	+ 12.8	+ 12.0	+ 9.9	+ 8.3	+ 2.3	+ 1.4	- 1.3	- 2.8	- 0.3	+ 1.0	+ 4.1	+ 6.0	+ 5.9	+ 6.3	+ 6.1	+ 5.7
28th	+ 5.4	+ 5.7	+ 6.2	+ 5.8	+ 6.4	+ 6.5	+ 7.1	+ 8.9	+ 10.2	+ 10.4	+ 8.4	+ 6.7	+ 4.2	+ 0.4	- 2.4	- 2.7	- 0.7	+ 1.5	+ 3.5	+ 4.8	+ 5.2	+ 5.5	+ 6.6	+ 6.3
29th	+ 6.3	+ 6.7	+ 6.6	+ 6.7	+ 7.4	+ 8.1	+ 8.1	+ 10.2	+ 11.1	+ 9.6	+ 7.4	+ 4.5	+ 1.9	- 1.0	- 2.8	0.0	+ 0.7	+ 1.5	+ 3.3	+ 4.2	+ 4.2	+ 5.2	+ 4.5	+ 4.3
30th	+ 5.8	+ 6.1	+ 6.4	+ 6.9	+ 7.2	+ 7.2	+ 7.6	+ 9.0	+ 8.8	+ 7.7	+ 6.5	+ 5.9	+ 5.5	+ 4.4	+ 3.8	+ 1.6	+ 6.0	+ 8.3	+ 9.4	+ 9.2	+ 7.7	+ 6.1	+ 6.0	+ 6.8
31st	+ 8.0	+ 8.0	+ 8.4	+ 7.7	+ 6.7	+ 9.0	+ 9.2	+ 9.2	+ 9.7	+ 8.8	+ 7.0	+ 5.4	+ 0.9	0.0	+ 1.8	+ 1.9	+ 3.9	+ 5.3	+ 6.5	+ 7.1	+ 7.7	+ 6.3	+ 6.9	+ 7.3
Means	+ 3.37	+ 2.91	+ 3.95	+ 4.40	+ 4.95	+ 5.07	+ 5.59	+ 6.44	+ 7.39	+ 6.93	+ 5.28	+ 2.81	+ 0.74	- 0.60	- 1.19	- 1.31	- 0.57	+ 1.44	+ 1.92	+ 1.90	+ 2.41	+ 2.62	+ 2.98	+ 2.80
Normals	+ 4.43	+ 4.59	+ 4.42	+ 5.20	+ 5.35	+ 5.61	+ 6.17	+ 7.05	+ 7.68	+ 7.27	+ 5.67	+ 3.72	+ 1.30	- 0.08	- 1.34	- 1.11	- 0.39	+ 2.23	+ 2.33	+ 2.74	+ 3.48	+ 3.57	+ 4.20	+ 3.61

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF SEPTEMBER 1861.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 7.4	+ 7.7	+ 8.5	+ 8.5	+ 9.0	+ 9.4	+ 9.8	+ 10.5	+ 12.2	+ 11.2	+ 10.1	+ 8.1	+ 6.4	+ 5.1	+ 3.5	+ 2.9	+ 3.8	+ 5.9	+ 6.8	+ 7.3	+ 7.9	+ 7.9	+ 7.9	+ 8.0
2d	+ 8.3	+ 8.2	+ 8.0	+ 8.0	+ 11.6	+ 11.8	+ 13.5	+ 13.2	+ 12.2	+ 9.6	+ 8.4	+ 2.1	- 0.9	- 2.9	- 6.1	- 4.0	- 3.4	- 5.7	- 1.6	- 1.4	+ 1.7	+ 3.1	+ 3.1	+ 2.7
3d	+ 2.9	+ 3.4	+ 8.3	+ 5.2	+ 5.4	+ 5.6	+ 6.8	+ 7.4	+ 8.1	+ 7.3	+ 3.9	0.0	- 2.4	- 1.1	- 0.4	- 5.0	+ 2.1	+ 1.6	+ 3.2	+ 2.4	+ 0.5	+ 4.8	+ 3.6	+ 3.8
4th	+ 3.4	+ 6.3	+ 3.9	+ 3.9	+ 4.9	+ 5.1	+ 4.3	+ 2.6	+ 7.3	+ 5.8	+ 3.8	+ 0.4	+ 1.0	-	- 4.8	- 3.0	- 1.9	- 0.3	+ 1.3	+ 0.5	+ 2.7	+ 3.6	+ 3.3	+ 5.3
5th	+ 4.8	+ 4.6	+ 5.2	+ 6.3	+ 7.0	+ 6.5	+ 7.3	+ 9.6	+ 10.0	+ 8.7	+ 3.8	+ 0.1	- 2.3	- 2.8	- 2.6	- 13.6	- 2.9	0.0	+ 1.1	+ 0.6	+ 1.9	+ 1.0	+ 1.9	+ 2.5
6th	+ 3.9	+ 2.8	+ 4.3	+ 3.3	+ 5.2	+ 4.9	+ 6.5	+ 4.9	+ 8.8	+ 6.1	+ 2.6	+ 1.3	- 1.3	- 4.3	- 4.3	- 6.0	- 5.7	- 4.2	- 7.9	- 3.8	- 1.5	+ 0.5	+ 1.2	+ 0.9
7th	+ 0.6	+ 2.9	+ 2.0	+ 2.6	+ 3.5	+ 3.3	+ 3.8	+ 3.9	+ 2.2	+ 0.6	0.0	- 1.5	- 5.4	- 7.2	- 6.0	- 4.0	- 1.9	+ 0.4	+ 1.2	+ 1.7	+ 1.6	+ 0.9	+ 2.5	+ 4.0
8th	+ 3.5	+ 4.0	+ 4.1	+ 4.0	+ 4.3	+ 5.1	+ 14.8	+ 6.8	+ 6.9	+ 3.8	+ 0.1	- 2.6	- 4.5	- 6.9	- 7.7	- 5.2	- 2.1	- 0.3	+ 0.9	+ 1.7	+ 3.5	+ 3.3	+ 3.0	+ 2.8
9th	+ 1.5	+ 2.2	+ 2.7	+ 3.9	+ 4.7	+ 8.7	+ 6.8	+ 7.6	+ 2.3	- 0.4	- 0.2	- 5.3	- 8.3	- 6.2	- 6.5	- 4.0	- 1.5	- 0.3	+ 0.8	+ 1.6	+ 2.0	+ 2.4	+ 2.6	+ 3.3
10th	+ 3.3	+ 2.9	+ 3.1	+ 2.8	+ 3.7	+ 3.3	+ 4.3	+ 7.4	+ 8.1	+ 6.7	+ 5.2	+ 3.2	+ 0.1	- 1.9	- 2.5	- 2.1	+ 0.2	+ 3.1	+ 3.6	+ 4.6	+ 5.9	+ 6.8	+ 7.0	+ 6.9
11th	+ 7.0	+ 7.1	+ 7.2	+ 7.1	+ 7.3	+ 7.9	+ 8.3	+ 8.4	+ 7.6	+ 5.5	+ 3.3	- 0.1	- 3.6	- 3.3	- 1.5	+ 0.9	+ 3.1	+ 4.0	+ 4.4	+ 5.0	+ 5.6	+ 6.0	+ 6.4	+ 6.5
12th	+ 6.3	+ 6.8	+ 7.8	+ 7.9	+ 7.7	+ 7.8	+ 8.6	+ 10.1	+ 10.3	+ 7.9	+ 6.0	+ 4.5	+ 2.1	+ 0.3	+ 1.1	+ 4.2	+ 4.0	+ 6.0	+ 7.0	+ 6.7	+ 5.8	+ 8.2	+ 7.8	+ 8.0
13th	+ 8.0	+ 8.5	+ 9.0	+ 8.9	+ 9.3	+ 10.2	+ 10.9	+ 11.7	+ 10.9	+ 9.3	+ 6.5	+ 5.1	+ 4.7	+ 3.6	+ 2.5	+ 3.1	+ 1.5	+ 1.4	- 0.6	+ 0.9	+ 1.4	+ 2.5	+ 5.1	+ 7.6
14th	+ 7.4	+ 8.0	+ 8.1	+ 8.4	+ 8.4	+ 8.6	+ 8.6	+ 9.8	+ 11.1	+ 10.6	+ 6.8	+ 2.7	+ 0.2	- 1.2	- 0.2	+ 0.5	- 0.7	- 0.7	- 0.0	+ 0.5	- 1.4	- 1.9	+ 1.2	- 0.3
15th	+ 0.5	+ 2.7	+ 2.5	+ 3.4	+ 3.4	+ 4.3	+ 5.3	+ 7.8	+ 8.1	+ 6.7	+ 5.2	+ 2.3	+ 0.3	- 1.6	- 2.1	- 0.9	+ 1.6	+ 2.9	+ 5.4	+ 7.8	+ 7.3	+ 9.0	+ 4.5	+ 1.8
16th	+ 2.0	+ 9.4	+ 1.3	+ 3.2	+ 6.9	+ 5.9	+ 7.5	+ 6.0	+ 10.8	+ 3.4	- 0.8	- 8.8	- 12.2	- 10.4	- 7.1	- 9.3	- 9.9	- 9.3	- 3.8	- 11.4	- 5.1	+ 5.8	- 1.8	- 3.6
17th	+ 0.2	+ 5.2	- 1.0	+ 1.2	- 1.0	- 0.4	- 1.3	- 0.4	+ 8.7	- 1.1	- 2.7	- 3.3	- 2.6	- 12.3	- 6.8	- 3.0	- 2.4	- 1.4	- 2.6	- 0.8	+ 0.6	+ 0.8	+ 1.8	+ 2.2
18th	+ 5.2	+ 13.3	+ 3.4	+ 4.4	+ 11.5	+ 0.4	+ 3.5	+ 6.2	+ 5.6	+ 3.5	+ 1.1	- 1.6	- 3.3	- 4.7	- 2.5	- 2.6	+ 0.9	+ 0.4	- 0.8	+ 1.6	- 3.6	- 1.9	- 0.6	+ 3.9
19th	0.0	+ 1.1	+ 1.6	+ 1.9	+ 5.6	+ 4.9	+ 4.7	+ 2.4	+ 4.5	+ 3.2	- 0.4	- 3.7	- 8.7	- 8.3	- 6.7	- 2.0	+ 0.1	- 0.1	+ 1.6	- 0.9	- 2.7	+ 1.6	+ 1.6	- 1.0
20th	- 2.0	+ 8.1	- 0.4	+ 0.5	+ 0.3	+ 0.4	+ 2.1	+ 0.1	+ 0.9	0.0	- 3.3	- 5.2	- 4.3	- 4.3	- 6.3	- 9.3	- 4.5	- 3.0	- 6.1	- 2.8	+ 2.8	+ 0.7	0.0	+ 2.0
21st	+ 2.6	+ 4.9	+ 4.6	+ 4.5	+ 3.2	+ 3.9	+ 4.5	+ 5.0	+ 4.8	+ 2.5	- 2.0	- 6.4	- 9.4	- 7.3	- 6.2	- 2.2	- 1.2	- 1.6	+ 0.3	+ 2.1	+ 4.2	+ 2.7	+ 2.9	+ 3.7
22d	+ 3.7	+ 4.8	+ 5.4	+ 4.2	+ 4.3	+ 3.9	+ 5.0	+ 6.2	+ 4.9	- 7.7	- 1.7	- 4.3	- 4.9	- 4.1	- 1.1	+ 1.4	+ 3.9	+ 13.7	+ 14.0	+ 4.5	+ 3.6	+ 3.9	+ 4.0	+ 4.5
23d	+ 4.5	+ 4.8	+ 4.7	+ 5.9	+ 5.9	+ 5.8	+ 7.0	+ 7.9	+ 7.3	+ 5.3	+ 1.7	- 2.8	- 3.4	- 2.5	- 0.2	+ 0.5	+ 2.2	+ 3.3	+ 4.0	+ 4.6	+ 5.2	+ 5.7	+ 5.4	+ 6.1
24th	+ 7.5	+ 7.2	+ 12.3	+ 10.4	+ 9.1	+ 9.2	+ 7.7	+ 4.7	- 0.4	+ 4.2	+ 0.5	- 2.5	- 5.2	- 6.6	- 5.1	- 0.1	- 1.5	- 1.8	+ 0.9	- 0.1	+ 3.6	+ 5.1	+ 5.2	+ 5.6
25th	+ 8.8	+ 5.6	+ 4.3	+ 5.2	+ 6.1	+ 6.8	+ 6.8	+ 7.4	+ 5.4	+ 1.2	- 2.6	- 5.2	- 5.9	- 5.9	- 4.6	- 3.8	- 3.7	- 0.8	- 0.1	+ 4.8	+ 4.8	+ 2.0	+ 13.5	+ 2.6
26th	+ 12.6	+ 4.7	+ 3.7	+ 5.2	+ 6.4	+ 7.7	+ 7.5	+ 9.3	+ 7.7	+ 2.2	- 1.0	- 7.2	- 9.0	- 10.6	- 9.7	- 7.1	- 5.0	- 1.9	- 0.4	- 2.0	+ 1.7	+ 1.9	+ 5.2	- 0.4
27th	+ 0.9	+ 1.2	+ 0.9	+ 2.6	- 0.1	- 0.1	+ 0.9	+ 1.2	+ 0.6	- 1.6	- 3.6	- 4.2	- 4.9	- 3.3	- 2.8	- 2.7	- 1.6	- 0.5	- 0.1	+ 0.5	+ 0.8	+ 2.5	+ 1.8	+ 2.9
28th	+ 3.4	+ 4.1	+ 3.2	+ 2.7	+ 3.2	+ 3.3	+ 3.3	+ 3.0	+ 2.9	+ 0.7	- 1.7	- 4.6	- 6.5	- 7.6	- 6.6	- 6.2	- 5.6	- 4.1	- 3.8	- 4.1	- 4.6	- 1.4	- 0.8	- 0.1
29th	+ 1.4	+ 2.0	+ 2.4	+ 2.3	+ 2.4	+ 3.4	+ 3.2	+ 3.1	+ 2.1	0.0	- 2.2	- 4.3	- 6.2	- 5.6	- 4.6	- 3.2	- 3.0	- 3.3	- 0.5	- 3.6	- 3.8	- 1.5	- 1.4	
30th	+ 0.4	- 0.1	- 0.4	0.0	+ 1.0	+ 1.1	+ 1.3	+ 1.9	+ 1.5	- 1.3	- 4.0	- 5.8	- 6.3	- 4.2	- 2.2	- 1.3	- 1.0	- 0.9	- 1.0	0.0	+ 1.1	+ 2.1	+ 1.2	+ 3.0
31st																								
Means	+ 4.00	+ 5.15	+ 4.36	+ 4.61	+ 5.34	+ 5.29	+ 6.11	+ 6.19	+ 6.45	+ 3.80	+ 1.43	- 1.65	- 3.56	- 4.42	- 3.67	- 2.92	- 1.20	+ 0.08	+ 0.91	+ 0.95	+ 1.66	+ 2.86	+ 3.30	+ 3.13
Normals	+ 3.70	+ 4.87	+ 4.08	+ 4.61	+ 5.34	+ 5.07	+ 5.79	+ 6.17	+ 6.68	+ 3.56	+ 0.87	- 1.93	- 3.91	- 4.61	- 3.92	- 2.27	- 0.90	- 0.07	+ 0.91	+ 1.15	+ 2.13	+ 3.09	+ 2.95	+ 3.36

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF OCTOBER 1861.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 2.5	+ 2.6	+ 3.0	+ 2.8	+ 3.3	+ 3.8	+ 4.2	+ 4.4	+ 1.7	- 0.4	- 1.3	- 0.6	- 1.2	- 2.8	- 1.7	- 3.4	+ 1.6	+ 2.1	+ 2.0	+ 2.5	+ 2.1	+ 2.5	+ 3.9	+ 3.3
2d	+ 3.2	+ 3.9	+ 4.8	+ 5.6	+ 6.6	+ 7.1	+ 7.7	+ 7.4	+ 7.9	+ 5.6	+ 3.7	+ 2.2	+ 1.4	+ 1.1	+ 2.0	+ 2.7	+ 2.4	+ 2.4	+ 3.7	+ 4.2	+ 5.3	+ 5.5	+ 5.6	+ 5.2
3d	+ 4.8	+ 4.7	+ 7.7	+ 6.7	+ 7.6	+ 7.0	+ 7.3	+ 6.1	+ 5.5	+ 1.3	- 4.7	- 6.9	- 8.3	- 8.2	- 4.2	- 4.8	- 3.2	- 1.6	-	+ 0.6	+ 0.2	+ 1.1	+ 2.5	+ 2.8
4th	+ 3.1	+ 4.2	+ 4.3	+ 4.1	+ 4.7	+ 5.6	+ 6.6	+ 6.6	+ 6.0	+ 3.8	- 0.1	- 2.6	- 3.0	- 1.5	+ 0.9	+ 3.6	+ 5.3	+ 5.1	+ 7.1	+ 6.3	+ 6.6	+ 5.8	+ 7.0	+ 7.3
5th	+ 7.3	+ 7.6	+ 7.7	+ 7.9	+ 8.7	+ 9.8	+ 10.8	+ 11.3	+ 9.3	+ 6.4	+ 2.6	+ 0.4	+ 1.1	+ 2.7	+ 5.1	+ 6.4	+ 3.9	+ 5.3	+ 6.8	+ 7.2	+ 9.4	+ 7.3	+ 8.0	+ 9.1
6th	+ 12.4	+ 9.8	+ 9.8	+ 10.5	+ 11.5	+ 11.8	+ 12.3	+ 12.7	+ 9.9	+ 6.8	+ 1.4	- 2.3	- 1.4	- 1.0	- 0.2	+ 1.8	+ 2.9	+ 3.3	+ 14.0	+ 4.8	+ 5.7	+ 6.3	+ 6.5	+ 6.0
7th	+ 7.2	+ 6.5	+ 6.2	+ 5.7	+ 5.8	+ 6.2	+ 6.4	+ 6.8	+ 6.7	+ 4.2	- 0.3	- 3.5	- 4.7	- 4.2	- 1.8	- 1.1	+ 0.3	+ 1.8	+ 1.6	+ 2.0	+ 2.4	+ 3.2	+ 4.0	+ 4.9
8th	+ 4.9	+ 4.7	+ 4.7	+ 5.0	+ 6.2	+ 7.2	+ 8.2	+ 8.9	+ 9.5	+ 6.4	+ 2.7	- 2.4	- 3.6	- 1.9	+ 0.3	+ 0.8	- 0.2	+ 1.3	+ 3.0	+ 2.2	+ 0.8	+ 1.5	+ 2.2	+ 3.8
9th	+ 5.9	+ 6.8	+ 7.0	+ 7.0	+ 8.4	+ 8.3	+ 8.2	+ 8.5	+ 7.7	+ 5.7	+ 0.9	- 2.6	- 3.7	- 3.7	- 1.2	+ 0.5	- 0.9	+ 1.4	+ 2.3	+ 3.3	+ 3.6	+ 5.4	+ 5.3	+ 5.4
10th	+ 5.6	+ 5.7	+ 5.8	+ 5.8	+ 6.0	+ 5.8	+ 6.3	+ 7.1	+ 6.2	+ 4.5	+ 1.8	+ 0.6	+ 0.6	+ 1.1	+ 4.9	+ 6.2	+ 7.0	+ 7.7	+ 8.6	+ 13.6	+ 8.7	- 1.3	+ 4.9	- 9.4
11th	- 11.1	- 2.9	- 8.9	- 1.1	- 0.2	- 3.9	- 6.2	- 7.2	- 9.4	- 11.5	- 14.0	- 16.5	- 15.7	- 12.0	- 8.7	+ 1.6	- 3.7	- 2.1	- 3.0	0.0	+ 1.0	+ 1.6	+ 3.9	+ 4.9
12th	+ 7.9	+ 3.8	+ 9.9	+ 3.8	+ 3.5	+ 1.5	+ 1.8	+ 2.5	- 0.5	- 2.6	- 2.7	- 5.4	- 5.9	- 3.5	+ 0.4	+ 0.8	+ 1.3	+ 0.8	+ 0.9	+ 1.9	+ 2.9	+ 2.6	+ 9.8	+ 3.2
13th	+ 3.2	+ 9.1	+ 8.0	+ 5.9	+ 6.3	+ 5.4	+ 6.5	+ 6.0	+ 4.8	+ 3.1	- 0.7	- 3.2	- 2.7	- 3.1	- 4.2	- 2.9	- 2.2	+ 2.7	+ 2.9	+ 5.4	+ 5.9	+ 9.3	+ 9.6	+ 7.5
14th	+ 6.3	+ 9.2	+ 8.5	+ 8.3	+ 6.1	+ 8.6	+ 7.7	+ 7.0	+ 8.1	+ 3.6	- 1.2	- 4.1	- 5.2	- 4.9	- 4.3	- 1.8	- 1.4	+ 0.9	+ 2.2	+ 3.9	+ 4.3	+ 3.9	+ 12.1	+ 5.8
15th	+ 4.3	+ 5.0	+ 5.2	+ 6.0	+ 6.5	+ 8.8	+ 7.7	+ 5.1	+ 5.4	+ 2.7	- 0.3	- 5.2	- 3.0	- 4.4	+ 0.9	+ 1.9	+ 4.8	+ 0.7	+ 2.2	+ 0.6	+ 0.1	+ 0.9	+ 1.8	+ 1.8
16th	+ 2.7	+ 3.7	+ 4.1	+ 4.6	+ 6.1	+ 5.8	+ 6.6	+ 6.3	+ 5.1	+ 4.6	+ 2.9	+ 0.3	+ 0.1	- 0.2	+ 0.6	+ 3.4	+ 5.0	+ 4.2	+ 5.9	+ 7.6	+ 6.0	+ 6.0	+ 12.6	+ 5.7
17th	+ 3.8	+ 4.9	+ 5.7	+ 6.5	+ 6.5	+ 6.8	+ 7.0	+ 6.7	+ 5.7	+ 1.9	- 0.7	- 1.8	- 2.1	- 1.3	- 10.2	+ 1.4	+ 3.1	+ 4.5	+ 5.1	+ 5.2	+ 5.3	+ 5.4	+ 5.8	+ 6.1
18th	+ 6.7	+ 6.0	+ 6.9	+ 7.5	+ 7.5	+ 7.8	+ 8.7	+ 6.8	+ 3.4	- 1.6	- 4.9	- 7.0	- 5.5	- 5.6	- 3.3	- 3.0	+ 1.0	+ 1.5	+ 2.1	+ 3.8	+ 4.3	+ 4.8	+ 5.2	+ 6.9
19th	+ 8.1	+ 7.4	+ 7.0	+ 6.2	+ 6.4	+ 7.5	+ 6.2	+ 4.5	+ 1.3	- 2.9	- 7.1	- 8.6	- 8.8	- 7.5	- 6.0	- 4.7	- 3.8	- 2.0	- 1.8	+ 0.8	+ 1.1	+ 2.2	+ 1.9	+ 2.4
20th	+ 2.7	+ 3.5	+ 3.5	+ 3.9	+ 3.9	+ 4.9	+ 5.2	+ 5.1	+ 2.4	- 2.9	- 5.2	- 7.5	- 5.6	- 4.7	- 5.2	- 2.9	- 7.4	- 3.3	- 4.2	- 5.6	- 5.8	- 7.4	- 4.7	- 4.8
21st	- 2.2	- 2.6	- 1.5	- 2.2	- 3.1	- 3.1	- 3.0	- 6.2	- 7.1	- 10.7	- 12.1	- 13.6	- 13.7	- 11.2	- 9.1	- 8.4	- 6.5	- 5.6	- 4.4	- 3.5	- 2.2	- 1.8	- 1.4	- 1.0
22d	- 0.5	- 0.5	+ 0.8	+ 1.7	+ 1.7	+ 2.2	+ 3.2	+ 2.4	- 0.6	- 2.3	- 2.7	- 3.8	- 5.0	- 6.4	- 5.9	- 3.0	+ 0.4	- 0.7	- 0.1	+ 0.4	+ 0.6	+ 0.7	+ 1.0	+ 0.9
23d	+ 1.7	+ 1.6	+ 1.6	+ 3.7	+ 2.5	+ 1.3	+ 1.5	- 0.5	- 3.0	- 5.6	- 8.6	- 9.4	- 9.2	- 6.4	- 4.6	- 3.9	- 1.8	- 2.3	- 0.1	+ 0.5	+ 0.3	+ 0.2	+ 0.5	+ 0.6
24th	+ 0.8	+ 0.8	+ 0.6	+ 1.0	+ 0.8	+ 1.8	+ 3.0	+ 2.5	+ 1.2	- 1.0	- 3.7	- 6.8	- 7.2	- 5.3	- 2.6	+ 1.4	+ 2.8	+ 4.2	+ 6.5	+ 1.0	- 6.6	- 3.7	- 7.0	- 9.1
25th	- 3.2	- 2.7	+ 0.3	- 4.1	- 0.7	+ 1.1	+ 2.1	+ 4.6	- 0.3	- 4.2	- 10.2	- 11.9	- 16.5	- 12.7	- 12.2	- 10.7	- 11.9	- 10.8	- 2.6	- 0.7	- 0.9	+ 0.1	- 0.9	- 1.1
26th	- 0.3	+ 1.9	+ 0.4	+ 0.4	+ 0.2	+ 1.7	+ 2.8	+ 3.6	- 0.4	+ 0.9	- 2.3	- 4.8	- 9.5	- 9.4	- 8.3	- 4.0	- 8.0	- 2.6	- 2.6	+ 0.9	- 0.1	+ 2.3	+ 1.6	+ 2.1
27th	+ 6.1	+ 3.3	+ 1.4	+ 1.5	+ 2.7	+ 4.2	+ 7.5	+ 5.9	+ 2.2	- 0.6	- 4.6	- 7.8	- 12.0	- 8.1	- 5.0	- 3.2	- 2.6	- 2.4	- 0.1	- 0.9	+ 0.5	+ 1.7	+ 1.3	+ 3.4
28th	+ 3.8	+ 3.4	+ 3.8	+ 4.0	+ 4.8	+ 4.8	+ 5.6	+ 5.1	+ 3.7	+ 2.2	+ 0.2	+ 0.1	+ 0.8	+ 2.6	+ 2.3	+ 8.6	+ 10.9	+ 6.3	- 1.6	+ 2.0	+ 5.1	+ 6.5	+ 6.2	+ 7.4
29th	+ 5.3	+ 7.5	+ 8.3	+ 13.2	+ 11.6	+ 5.5	+ 5.5	+ 4.3	+ 5.8	+ 1.7	+ 0.6	- 1.2	- 2.5	- 1.0	+ 1.6	0.0	+ 0.9	+ 1.4	+ 1.7	+ 3.2	+ 4.1	+ 4.6	+ 4.3	+ 4.5
30th	+ 5.5	+ 5.6	+ 5.4	+ 6.7	+ 7.3	+ 7.9	+ 9.1	+ 8.6	+ 7.2	+ 4.7	+ 1.5	- 0.9	- 1.5	- 0.7	+ 1.8	+ 3.1	+ 5.4	+ 5.8	+ 7.1	+ 7.4	+ 7.3	+ 7.2	+ 5.3	+ 6.9
31st	+ 7.2	+ 7.4	+ 7.8	+ 7.9	+ 8.3	+ 8.4	+ 8.8	+ 8.1	+ 5.7	+ 2.8	+ 0.0	- 1.7	- 1.9	- 1.7	+ 0.5	+ 3.2	+ 4.9	+ 5.3	+ 5.4	+ 6.4	+ 7.1	+ 7.8	+ 7.7	+ 7.1
Means	+ 3.73	+ 4.25	+ 4.51	+ 4.73	+ 5.08	+ 5.21	+ 5.65	+ 5.19	+ 3.58	+ 0.86	- 2.23	- 4.47	- 5.01	- 4.06	- 2.50	- 0.34	+ 0.33	+ 1.14	+ 2.35	+ 2.81	+ 2.75	+ 2.97	+ 4.08	+ 3.21
Normals	+4.20	+5.00	+5.18	+4.99	+5.14	+5.60	+6.15	+5.77	+4.66	+1.94	-0.90	-3.66	-3.61	-3.67	-1.89	-0.48	+1.05	+1.57	+2.41	+2.72	+3.15	+3.56	+4.20	+4.39

LEAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF NOVEMBER 1861.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 8.4	+ 9.2	+ 9.2	+ 9.1	+ 9.0	+ 9.7	+10.2	+10.0	+ 7.5	+ 5.1	+ 3.2	+ 1.7	+ 1.8	+ 2.4	+ 3.4	+ 6.1	+ 6.8	+ 8.6	+ 6.9	+ 8.1	+ 8.2	+ 8.8	+ 8.9	+ 9.2
2d	+10.5	+ 8.9	+ 8.2	+10.1	+ 9.6	+10.2	+10.4	+10.0	+ 7.8	+ 5.3	+ 1.4	+ 0.1	+ 0.3	+ 2.2	+10.0	+ 6.3	+ 6.8	+ 7.4	+ 1.4	+ 8.6	+ 9.8	0.0	+10.3	+10.5
3d	+11.4	+10.3	+ 9.5	+10.0	+12.2	+12.1	+11.5	+10.2	+ 6.4	+ 2.7	+ 0.3	+ 2.9	+ 2.6	+ 0.1	+ 0.6	+ 3.8	+ 4.8	+ 6.6	+ 6.3	+ 8.2	+ 7.7	+ 9.2	+ 9.5	+ 9.6
4th	+10.2	+10.2	+10.2	+10.8	+11.1	+11.3	+12.4	+10.7	+ 7.4	+ 2.2	+ 4.2	+ 6.4	+ 5.8	+ 3.3	+ 0.2	+ 2.2	+ 3.7	+ 5.4	+ 5.4	+ 5.5	+ 6.7	+ 6.6	+ 7.5	+ 8.3
5th	+ 8.4	+ 8.6	+ 8.6	+ 9.1	+ 9.7	+10.6	+10.8	+ 8.4	+ 4.4	+ 0.2	+ 3.8	+ 5.6	+ 1.8	+ 0.8	+ 3.5	+ 5.6	+ 6.2	+ 3.2	+ 2.7	+ 4.7	+ 5.2	+ 6.1	+ 6.6	+ 6.2
6th	+ 6.5	+ 6.0	+ 6.4	+ 7.5	+ 8.2	+ 7.9	+ 8.6	+ 7.7	+ 5.3	+ 2.4	+ 2.8	+ 1.5	+ 1.2	+ 2.7	+ 3.3	+ 4.0	+ 6.5	+ 7.0	+ 6.0	+ 8.2	+ 8.9	+ 8.1	+ 8.1	+ 6.5
7th	+ 7.3	+ 7.4	+ 9.5	+ 8.0	+ 8.0	+ 9.0	+ 9.3	+ 8.3	+ 5.9	+ 2.7	+ 0.3	+ 0.5	+ 0.2	+ 1.2	+ 5.4	+ 7.3	+ 9.2	+ 9.3	+10.3	+10.5	+10.1	+ 6.6	+ 7.8	+ 0.2
8th	+ 2.7	+ 4.1	+12.6	+11.1	+ 3.6	+ 0.1	+ 5.8	+ 4.5	+ 5.1	+11.5	+14.1	+12.4	+13.0	+12.6	+ 8.0	+ 9.2	+11.2	+10.0	+ 2.7	+ 2.8	+ 6.0	+ 4.0	+ 1.0	+ 3.4
9th	+ 4.3	+ 0.9	+ 6.1	+ 5.5	+ 6.2	+ 6.2	+ 0.5	+ 2.1	+ 4.1	+ 7.1	+ 8.5	+ 9.3	+ 9.4	+ 8.3	+ 6.2	+ 4.4	+ 5.6	+ 1.3	+ 2.9	+ 2.4	+ 3.0	+ 0.5	+ 0.9	+ 0.2
10th	+ 0.6	+ 1.3	+ 0.8	+ 0.2	+ 1.2	+ 1.4	+ 2.2	+ 0.7	+ 3.2	+ 6.1	+ 8.8	+ 9.8	+ 8.4	+ 8.2	+ 5.2	+ 2.3	+ 1.0	+ 0.3	+ 0.2	+ 1.4	+ 0.7	+ 0.5	+ 1.7	+ 3.2
11th	+ 5.1	+ 4.1	+ 3.7	+ 4.3	+ 5.1	+ 3.8	+ 5.0	+ 4.8	+ 4.0	+ 1.6	+ 0.9	+ 1.9	+ 2.5	+ 1.3	+ 0.9	+ 1.7	+ 3.9	+ 2.8	+ 3.1	+ 2.0	+ 2.0	+ 1.4	+ 6.0	+ 3.9
12th	+ 1.9	+ 2.8	+ 2.6	+ 3.4	+ 3.7	+ 3.6	+ 4.5	+ 3.4	+ 0.6	+ 2.9	+ 4.2	+ 4.8	+ 2.1	+ 1.2	+ 1.9	+ 5.9	+ 4.5	+ 7.4	+ 5.0	+ 6.5	+ 5.9	+ 4.6	+ 3.2	+10.0
13th	+ 3.2	+ 3.0	+ 3.5	+ 4.0	+ 4.0	+ 3.8	+ 3.3	+ 1.8	+ 0.6	+ 1.6	+ 4.1	+ 5.1	+ 2.7	+ 1.3	+ 0.4	+ 2.2	+ 5.7	+ 5.1	+ 4.9	+ 5.1	+ 4.9	+ 2.0	+ 2.2	+ 3.7
14th	+ 4.0	+ 4.6	+ 5.1	+ 4.6	+ 4.7	+ 4.5	+ 4.7	+ 2.9	+ 1.1	+ 1.0	+ 3.0	+ 3.3	+ 1.8	+ 0.4	+ 3.9	+ 4.5	+ 3.0	+ 3.9	+ 2.7	+ 5.1	+11.1	+ 1.8	+ 5.6	+ 3.4
15th	+ 3.3	+ 3.7	+ 3.4	+ 3.5	+ 6.8	+ 6.5	+ 5.8	+ 3.2	+ 1.5	+ 5.9	+ 6.3	+ 5.9	+ 5.1	+ 1.6	+ 2.3	+ 0.9	+ 0.5	+ 1.9	+ 0.8	+ 1.4	+ 1.6	+ 0.4	+ 1.6	+ 0.9
16th	+ 1.8	+ 6.8	+ 4.5	+ 4.0	+ 4.3	+ 5.0	+ 3.9	+ 1.5	+ 0.8	+ 3.4	+ 4.9	+ 2.7	+ 2.3	+ 1.2	+ 0.5	+ 0.1	+ 0.3	+ 2.6	+ 0.8	+ 1.8	+ 0.1	+ 7.5	+ 2.9	
17th	+ 1.1	+ 0.4	+ 1.1	+ 0.1	+ 0.5	+ 1.3	+ 1.6	+ 0.4	+ 2.4	+ 6.4	+ 6.4	+ 7.0	+ 5.0	+ 2.1	+ 0.6	+ 0.0	+10.8	+ 1.1	+ 1.3	+ 1.6	+ 2.5	+ 2.6	+ 2.5	+ 2.5
18th	+ 2.6	+ 2.7	+ 2.5	+ 2.6	+ 2.8	+ 3.4	+ 3.6	+ 2.7	+ 0.1	+ 4.1	+ 7.3	+ 6.7	+ 8.7	+ 4.6	+ 3.4	+ 2.0	+ 3.9	+ 4.2	+ 5.0	+ 5.1	+ 3.2	+ 1.5	+ 3.4	+ 1.5
19th	+ 4.3	+ 4.2	+ 3.3	+ 3.4	+ 2.7	+ 1.9	+ 2.2	+ 3.1	+ 1.1	+ 5.9	+ 9.0	+ 7.0	+ 5.8	+ 2.4	+ 0.6	+ 1.2	+ 1.9	+ 2.1	+ 4.1	+ 6.5	+ 4.0	+ 3.4	+ 3.8	+ 3.3
20th	+ 0.9	+ 1.0	+ 0.6	+ 1.7	+ 2.1	+ 2.1	+ 2.3	+ 1.6	+ 6.6	+ 9.7	+11.4	+12.4	+11.8	+ 6.9	+ 0.9	+ 0.1	+ 0.5	+ 0.7	+ 0.1	+ 0.1	+ 0.5	+ 1.4	+ 1.1	
21st	+ 1.6	+ 1.3	+ 1.2	+ 1.1	+ 2.0	+ 2.7	+ 3.6	+ 3.3	+ 1.3	+ 1.6	+ 3.6	+ 4.7	+ 2.8	+ 0.7	+ 1.0	+ 2.2	+ 6.2	+ 3.6	+ 3.6	+ 4.1	+ 4.7	+ 6.4	+ 6.3	+ 6.9
22d	+ 6.0	+ 5.8	+ 5.4	+ 6.1	+ 6.6	+ 6.4	+ 6.4	+ 5.8	+ 5.9	+ 4.7	+ 2.9	+ 0.5	+ 0.3	+ 1.8	+ 3.7	+ 4.6	+ 5.1	+ 5.9	+ 6.3	+ 6.9	+ 7.1	+ 7.2	+ 7.6	+ 9.3
23d	+ 8.5	+ 9.5	+ 8.3	+ 8.4	+ 7.5	+ 7.5	+ 8.5	+ 8.8	+ 5.9	+ 0.7	+ 3.4	+ 4.2	+ 2.1	+ 0.7	+ 0.7	+ 4.2	+ 3.0	+ 3.2	+ 5.6	+ 3.8	+ 5.3	+ 5.1	+ 4.6	+ 3.9
24th	+ 5.4	+ 3.1	+ 4.4	+ 4.5	+ 8.9	+ 8.0	+ 4.4	+ 1.2	+ 1.1	+ 0.1	+ 7.4	+ 8.8	+ 7.2	+ 4.0	+ 3.5	+ 2.0	+ 0.3	+ 0.2	+ 1.2	+ 3.3	+ 4.6	+ 4.3	+ 0.6	+ 5.6
25th	+ 4.4	+ 4.0	+ 4.3	+ 5.0	+ 5.7	+ 5.9	+ 7.3	+ 6.9	+ 4.5	+ 0.4	+ 3.6	+ 3.9	+ 2.7	+ 2.6	+ 4.4	+ 2.0	+ 1.9	+ 1.6	+ 1.5	+ 0.9	+ 0.5	+ 1.9	+ 1.9	+ 2.9
26th	+ 3.4	+ 3.1	+ 1.3	+ 3.6	+ 4.0	+ 1.2	+ 0.6	+ 0.6	+ 1.3	+ 5.3	+ 4.1	+ 3.2	+ 0.7	+ 0.3	+ 1.4	+ 1.8	+ 1.9	+ 1.6	+ 0.1	+ 0.2	+ 1.5	+ 2.5	+ 4.3	+ 3.4
27th	+ 3.8	+ 0.2	+ 0.9	+ 1.2	+ 2.2	+ 3.5	+ 3.2	+ 4.5	+ 6.4	+ 7.7	+ 8.9	+ 9.5	+ 7.3	+ 3.1	+ 1.5	+ 0.2	+ 1.1	+ 1.1	+ 0.8	+ 0.7	+ 0.6	+ 0.3	+ 0.1	+ 0.3
28th	+ 0.2	+ 0.9	+ 1.6	+ 1.2	+ 1.7	+ 2.7	+ 2.8	+ 2.5	+ 0.6	+ 3.5	+ 6.5	+ 6.8	+ 6.6	+ 4.8	+ 5.2	+ 4.7	+ 3.4	+ 3.5	+ 2.1	+ 1.8	+ 2.1	+ 1.2	+ 0.1	+ 0.6
29th	+ 0.8	+ 0.6	+ 0.1	+ 1.0	+ 0.7	+ 2.6	+ 1.9	+ 3.6	+ 0.5	+ 6.0	+ 8.6	+ 9.2	+ 4.6	+ 2.8	+ 0.5	+ 0.1	+ 0.7	+ 2.6	+ 4.3	+ 4.5	+ 3.5	+ 3.7	+ 3.5	0.0
30th	+ 2.6	+ 3.0	+ 2.4	+ 0.6	+ 0.9	+ 0.3	+ 0.2	+ 0.9	+ 2.4	+ 5.0	+ 6.6	+ 3.7	+ 1.3	+ 0.4	+ 1.2	+ 3.8	+ 4.1	+ 3.3	+ 3.2	+ 1.3	+ 0.4	+ 1.2	+ 0.4	+ 3.1
Means	+ 3.33	+ 3.85	+ 4.54	+ 4.49	+ 4.71	+ 4.84	+ 4.64	+ 3.67	+ 1.37	+ 2.12	+ 4.59	+ 5.24	+ 4.04	+ 2.16	+ 0.14	+ 1.46	+ 2.05	+ 2.30	+ 1.68	+ 2.71	+ 2.95	+ 2.27	+ 2.92	+ 3.28
Normals	+ 3.30	+ 4.34	+ 4.50	+ 4.55	+ 5.01	+ 4.64	+ 4.78	+ 3.78	+ 2.19	+ 2.30	+ 4.85	+ 5.21	+ 3.45	+ 1.57	+ 0.22	+ 2.30	+ 2.58	+ 2.49	+ 1.65	+ 3.03	+ 2.96	+ 1.79	+ 3.54	+ 3.52

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF DECEMBER 1861.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	— 0.2	+ 2.1	+ 0.9	+ 0.3	+ 1.3	+ 1.8	+ 1.7	+ 0.4	— 3.8	— 8.6	— 7.9	— 8.7	— 6.9	— 4.8	— 0.9	— 0.8	+ 1.2	+ 1.5	+ 1.2	+ 1.0	— 0.5	+ 2.0	+ 2.0	+ 1.6
2d	+ 3.5	+ 4.0	+ 7.0	+ 6.2	+ 6.3	+ 5.0	+ 5.6	+ 3.0	+ 0.3	— 1.2	— 0.2	— 1.0	— 2.0	+ 0.3	+ 1.2	+ 2.6	+ 5.7	+ 5.6	+ 6.0	+ 6.6	+ 6.0	+ 6.1	+ 5.6	+ 5.6
3d	+ 5.6	+ 5.5	+ 5.9	+ 6.2	+ 6.9	+ 7.6	+ 8.0	+ 7.9	+ 6.8	+ 5.7	+ 4.7	+ 5.8	+ 7.9	+ 9.4	+11.0	+11.8	+10.7	+ 8.4	+ 7.6	+ 9.8	+ 9.8	+ 9.8	+ 9.7	—
4th	+10.2	+10.7	+11.1	+11.7	+12.6	+13.4	+14.6	+13.3	+12.4	+ 8.8	+ 5.6	+ 5.5	+ 6.2	+ 6.9	+ 6.8	+ 8.8	+10.5	+12.3	+13.1	+10.6	+ 9.4	+11.5	+15.8	+ 5.8
5th	+ 6.6	+ 5.9	+ 9.6	+ 4.1	+ 2.0	+ 4.4	+ 2.7	— 0.8	— 1.2	— 7.1	— 7.5	— 8.5	— 9.3	— 4.7	+ 0.1	+ 2.5	+ 3.5	+ 6.4	+ 9.9	+ 3.7	+ 3.3	+ 9.7	+ 2.8	+ 4.3
6th	+ 6.0	+13.4	+ 4.8	+ 0.2	+ 4.5	+ 2.7	+ 3.4	+ 2.2	— 2.0	— 6.5	— 8.1	— 9.1	— 7.5	— 5.0	— 3.8	— 1.3	— 0.6	+ 2.5	— 2.0	— 1.5	— 2.3	+ 0.9	+ 5.0	+ 1.0
7th	+ 2.3	+ 2.2	+ 3.7	+ 4.9	— 0.3	+ 3.6	+ 4.9	— 1.5	— 1.0	— 8.1	— 7.5	—10.8	— 6.7	— 9.1	— 2.8	+ 1.2	+ 2.3	+ 1.6	+ 1.7	+ 2.7	+ 1.8	+ 2.4	+ 2.9	+ 4.7
8th	+ 1.3	+13.6	+ 1.8	+ 3.0	+ 4.3	+ 3.4	+ 4.3	+ 3.8	+ 1.6	— 2.9	— 7.1	— 8.6	— 9.2	— 7.0	— 4.5	— 1.9	+ 0.2	+ 1.2	+ 3.2	+ 3.8	+ 2.6	+ 2.3	+ 2.7	+ 2.4
9th	+ 1.5	+ 1.6	+ 4.1	+ 3.8	+ 4.8	+ 4.8	+ 5.6	+ 3.1	+ 2.0	+ 0.4	+ 1.6	+ 1.4	0.0	— 1.4	— 2.6	— 2.5	+ 0.9	+ 1.1	+ 2.2	+ 5.8	+ 4.5	+ 2.3	+ 3.2	+ 3.7
10th	+ 3.5	+ 3.5	+ 4.2	+ 5.0	0.0	0.0	+ 2.0	— 3.8	— 8.8	— 6.9	— 8.8	— 7.7	— 6.9	— 4.2	+ 0.6	+ 0.9	+ 0.3	+ 0.9	+ 1.4	— 4.0	— 1.1	— 2.6	+ 4.7	— 3.3
11th	— 4.6	— 4.1	— 0.8	— 1.6	— 0.6	+ 6.1	— 5.6	— 6.7	—13.3	—15.8	—13.0	—11.3	—10.8	—13.1	— 6.9	— 3.5	— 2.4	— 1.1	— 1.8	— 0.7	+ 1.7	+ 1.0	+ 0.4	— 0.1
12th	+ 5.0	+ 3.6	— 2.1	— 0.4	+ 0.8	+ 0.6	+ 0.6	— 2.1	— 6.6	— 9.7	—10.3	— 7.8	— 6.6	— 4.3	— 1.5	+ 0.8	+ 2.4	+ 1.7	+ 2.4	+ 1.1	+ 2.0	+ 2.4	+ 3.1	+ 3.6
13th	+ 3.3	+ 3.6	+ 4.5	+ 4.2	+ 3.2	+ 3.9	+ 4.6	+ 2.8	— 0.6	— 1.0	— 1.5	— 1.2	— 1.7	+ 1.6	+ 3.7	+ 3.4	+ 3.1	+ 2.9	+ 3.8	+ 3.4	+ 4.4	+ 4.2	+ 5.9	+ 6.0
14th	+ 5.0	+ 3.7	+ 3.7	+ 4.7	+ 5.1	+ 4.4	+ 5.7	+ 3.1	+ 0.7	— 2.2	— 4.2	— 2.0	+ 0.1	+ 0.7	+ 0.5	+ 1.6	+ 3.8	+ 1.2	+ 1.5	+ 1.3	+ 2.2	+ 3.0	+ 2.9	+ 1.6
15th	+ 3.1	+ 3.2	+ 3.1	+ 2.9	+ 3.0	+ 3.8	+ 4.6	+ 4.3	+ 2.3	— 0.6	— 1.3	— 1.0	— 1.3	— 0.2	+ 0.9	+ 3.3	+ 5.8	+ 5.6	+ 5.2	+ 3.8	+ 4.6	+ 5.5	+ 5.3	+ 4.5
16th	+ 4.5	+ 4.3	+ 4.6	+ 5.0	+ 4.8	+ 5.9	+ 6.2	+ 3.6	+ 1.7	— 0.3	— 1.4	— 2.6	— 2.8	— 0.4	+ 2.1	+ 2.3	+ 3.0	+ 2.9	+ 3.2	+ 3.3	+ 3.5	+ 4.4	+ 4.7	+ 4.5
17th	+ 4.5	+ 3.8	+ 3.7	+ 4.2	+ 4.4	+ 5.2	+ 5.6	+ 6.3	+ 5.3	+10.7	— 1.9	— 3.8	— 0.1	+ 1.8	+ 2.2	+ 4.4	+ 8.0	+ 6.5	+ 7.1	+ 3.8	+ 4.4	+ 4.2	+ 4.3	+ 3.1
18th	+ 2.6	+ 2.1	— 1.4	+ 2.8	+ 4.1	+ 1.8	+ 3.7	— 0.8	— 4.7	— 6.0	— 7.6	— 7.9	— 6.5	— 5.5	— 3.5	— 1.4	— 2.0	— 2.8	— 2.4	— 0.7	— 0.7	— 0.5	— 0.4	+ 1.5
19th	+ 0.9	— 0.6	— 1.4	+ 1.7	— 0.5	+ 0.4	+ 0.7	— 0.9	— 4.1	— 7.8	—12.2	—12.6	—12.2	— 9.3	— 5.2	+ 2.0	+ 3.0	+ 1.9	+ 2.7	— 8.7	+ 0.5	— 1.9	— 0.1	— 4.9
20th	— 1.6	+ 3.1	+ 8.5	+ 3.8	+ 4.7	+ 3.4	—11.1	—21.4	—18.3	—18.6	—18.5	—19.3	—20.9	—20.8	—16.8	—14.1	—11.4	—10.2	— 9.2	— 7.9	— 6.4	— 5.5	— 3.4	— 4.0
21st	— 2.3	— 3.5	+ 4.7	— 2.0	— 3.8	— 8.6	— 5.7	—10.5	—11.5	—17.5	—21.8	—20.8	—18.9	—16.0	—10.8	— 9.3	— 8.8	— 7.9	— 7.9	— 6.4	— 5.4	— 4.5	— 4.2	— 4.0
22d	— 3.8	— 3.2	— 4.2	— 4.3	— 4.6	— 3.6	— 2.9	— 3.0	— 4.4	— 9.5	—12.9	—14.6	—13.5	— 9.8	— 4.2	— 0.8	+ 1.5	+ 0.7	+ 0.2	— 0.3	+ 0.6	+ 1.5	+ 1.2	+ 1.6
23d	+ 1.2	+ 1.5	+ 1.8	+ 2.1	+ 2.4	+ 4.0	+ 2.8	+ 2.4	+ 1.1	— 3.5	— 7.2	— 4.4	+ 0.3	+ 4.3	+ 6.4	+ 7.3	+ 7.8	+ 7.3	+ 6.9	+ 7.2	+ 6.4	+ 9.7	+ 7.5	+ 7.7
24th	+10.1	+ 8.2	+ 7.6	+ 8.0	+ 8.7	+ 9.5	+10.2	+ 8.9	+ 6.0	+ 2.4	— 1.8	— 1.6	+ 0.9	+ 2.0	+ 3.4	+ 5.0	+ 6.0	+ 7.0	+ 7.9	+ 7.5	+ 7.8	+ 8.2	+ 8.8	+ 8.1
25th	+ 7.9	+ 8.1	+ 7.9	+ 7.6	+ 8.3	+ 9.2	+ 9.7	+ 8.7	+ 6.6	+ 3.4	+ 2.5	+ 2.6	+ 2.1	+ 2.9	+ 5.0	+ 8.3	+ 8.5	+ 3.5	+ 4.2	+ 3.0	+ 5.2	+ 7.7	+ 8.2	+ 8.2
26th	+ 8.2	+ 8.0	+ 7.7	+ 8.3	+ 8.1	+ 8.9	+ 9.6	+ 8.7	+ 5.8	+ 2.8	— 1.5	— 1.4	— 1.1	+ 2.9	+ 7.0	+ 9.3	+ 9.0	+ 7.4	+ 6.9	+ 7.2	+ 8.0	+ 9.0	+ 9.0	+ 9.5
27th	+ 9.7	+ 9.8	+ 8.5	+ 8.5	+ 9.1	+ 9.9	+10.2	+ 9.3	+ 6.7	+ 2.9	+ 1.6	+ 3.7	+ 5.4	+ 6.7	+ 6.8	+ 6.9	+ 7.1	+ 7.3	+ 7.8	+ 8.4	+ 9.5	+10.4	+10.8	+10.7
28th	+10.8	+10.7	+ 9.4	+10.3	+10.1	+ 9.6	+ 9.6	+ 9.8	+ 9.6	+ 8.0	+ 6.6	+ 7.8	+ 8.2	+ 9.8	+11.0	+10.7	+11.0	+ 9.5	+ 9.5	+10.0	+10.9	+11.3	+10.3	+10.7
29th	+10.3	+10.1	+ 9.3	+ 8.5	+ 6.7	+ 8.5	+ 8.9	+ 7.8	+ 3.5	+ 1.2	+ 0.5	+ 1.6	+ 2.9	+ 3.9	+ 7.9	+ 9.1	+ 8.7	+ 8.1	+10.2	+10.1	+10.5	+11.2	+11.0	+10.7
30th	+10.0	+10.4	+ 9.7	+ 9.3	+ 9.5	+10.4	+ 9.0	+ 7.2	+ 3.5	+ 1.1	— 0.5	+ 0.5	+ 2.8	+ 6.0	+ 9.0	+ 9.0	+ 9.8	+ 7.6	+ 8.5	+ 8.6	+ 9.3	+ 8.5	+ 8.5	+ 7.6
31st	+ 7.3	+ 8.1	+ 8.3	+ 8.2	+ 8.5	+ 8.2	+ 9.0	+ 7.4	+ 5.9	+ 3.9	+ 3.0	+ 2.8	+ 3.9	+ 5.6	+ 7.0	+ 6.9	+ 8.7	+ 8.8	+ 7.6	+ 8.3	+ 9.9	+ 9.4	+ 9.1	+ 9.3
Means	+ 4.27	+ 4.95	+ 4.81	+ 4.43	+ 4.34	+ 4.78	+ 4.46	+ 2.34	+ 0.05	— 2.66	— 4.57	— 4.34	— 3.36	— 1.64	+ 0.94	+ 2.66	+ 3.73	+ 3.46	+ 3.83	+ 3.25	+ 3.95	+ 4.63	+ 5.07	+ 4.06
Normals	+5.15	+5.28	+5.60	+4.71	+4.65	+5.25	+5.73	+3.20	+0.85	—2.31	—4.09	—3.88	—2.51	—0.90	+1.03	+2.85	+3.98	+4.29	+4.88	+3.80	+4.43	+5.17	+5.33	+4.60

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JANUARY 1862.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 9.5	+ 8.6	+ 7.6	+ 8.1	+ 7.0	+ 9.1	+ 7.6	+ 5.8	+ 3.5	+ 0.3	+ 1.5	+ 4.2	+ 4.7	+ 5.7	+ 6.6	+ 5.5	+ 5.7	+ 7.8	+ 8.1	+ 9.7	+ 11.2	+ 11.4	+ 12.3	+ 11.2
2d	+ 9.0	+ 8.9	+ 8.8	+ 8.1	+ 9.0	+ 9.8	+ 8.9	+ 7.3	+ 6.1	+ 0.2	+ 2.2	+ 3.8	+ 1.7	+ 1.8	+ 2.7	+ 4.5	+ 5.0	+ 7.0	+ 6.8	+ 8.7	+ 8.4	+ 9.0	+ 8.9	+ 8.2
3d	+ 10.3	+ 8.2	+ 9.5	+ 10.9	+ 13.4	+ 10.2	+ 10.0	+ 5.4	+ 3.3	+ 1.1	+ 1.8	+ 1.0	+ 3.3	+ 4.5	+ 5.1	+ 8.9	+ 6.1	+ 4.6	+ 6.7	+ 6.2	+ 7.5	+ 8.4	+ 8.5	+ 7.0
4th	+ 8.3	+ 6.8	+ 8.4	+ 7.2	+ 6.4	+ 7.6	+ 7.8	+ 6.5	+ 5.1	+ 1.5	+ 0.7	+ 0.5	+ 0.5	+ 4.0	+ 4.0	+ 5.2	+ 6.0	+ 6.6	+ 6.4	+ 3.4	+ 4.7	+ 6.0	+ 6.6	+ 7.0
5th	+ 6.5	+ 6.1	+ 6.7	+ 6.9	+ 6.8	+ 7.4	+ 7.3	+ 5.1	+ 2.2	+ 1.2	+ 5.8	+ 6.2	+ 7.5	+ 6.0	+ 5.1	+ 0.4	+ 1.9	+ 9.4	+ 1.7	+ 4.4	+ 7.0	+ 8.9	+ 8.4	+ 5.0
6th	+ 5.7	+ 4.8	+ 7.4	+ 3.3	+ 6.2	+ 5.6	+ 8.1	+ 6.8	+ 6.1	+ 3.8	+ 0.7	+ 3.0	+ 2.4	+ 0.3	+ 4.6	+ 8.7	+ 8.0	+ 8.7	+ 8.8	+ 7.1	+ 7.1	+ 6.4	+ 7.6	+ 9.7
7th	+ 7.3	+ 6.6	+ 7.2	+ 7.1	+ 9.2	+ 5.5	+ 7.8	+ 8.1	+ 5.5	+ 2.6	+ 0.8	+ 1.5	+ 0.8	+ 1.9	+ 5.2	+ 5.5	+ 6.6	+ 5.9	+ 4.8	+ 6.4	+ 6.7	+ 5.6	+ 6.9	+ 8.1
8th	+ 8.7	+ 8.9	+ 8.8	+ 8.5	+ 8.7	+ 9.2	+ 9.1	+ 7.7	+ 5.6	+ 1.4	+ 0.3	+ 1.5	+ 1.0	+ 1.2	+ 4.4	+ 6.0	+ 10.6	+ 10.5	+ 6.0	+ 8.7	+ 6.0	+ 6.6	+ 7.7	+ 8.5
9th	+ 7.9	+ 9.6	+ 8.6	+ 8.1	+ 8.0	+ 9.8	+ 9.3	+ 8.5	+ 5.0	+ 0.2	+ 3.4	+ 4.7	+ 4.1	+ 3.5	+ 0.1	+ 2.9	+ 4.6	+ 5.3	+ 7.3	+ 8.4	+ 7.9	+ 8.2	+ 8.7	+ 9.0
10th	+ 7.6	+ 7.9	+ 7.9	+ 7.9	+ 9.1	+ 9.1	+ 8.9	+ 6.4	+ 3.7	+ 0.7	+ 3.9	+ 4.5	+ 3.0	+ 1.5	+ 0.4	+ 2.5	+ 6.0	+ 9.4	+ 11.2	+ 10.4	+ 9.8	+ 10.8	+ 9.7	+ 9.6
11th	+ 9.2	+ 9.1	+ 9.5	+ 9.3	+ 9.0	+ 8.4	+ 9.2	+ 7.0	+ 4.3	+ 3.7	+ 1.5	+ 3.6	+ 2.8	+ 2.0	+ 2.0	+ 6.1	+ 5.8	+ 6.3	+ 10.5	+ 8.2	+ 10.0	+ 11.0	+ 11.1	+ 10.7
12th	+ 10.6	+ 10.1	+ 10.1	+ 10.0	+ 10.1	+ 9.8	+ 9.9	+ 7.3	+ 7.5	+ 4.9	+ 0.9	+ 0.8	+ 1.6	+ 2.5	+ 6.4	+ 4.6	+ 1.3	+ 8.1	+ 6.3	+ 5.6	+ 6.3	+ 7.8	+ 8.2	+ 8.7
13th	+ 9.5	+ 9.2	+ 8.8	+ 9.3	+ 8.9	+ 9.3	+ 9.2	+ 6.0	+ 3.4	+ 0.3	+ 2.4	+ 0.9	+ 2.0	+ 3.1	+ 3.3	+ 1.3	+ 0.4	+ 2.0	+ 3.2	+ 2.7	+ 4.3	+ 6.7	+ 5.4	+ 8.4
14th	+ 5.9	+ 6.0	+ 11.1	+ 6.3	+ 5.7	+ 9.1	+ 9.5	+ 7.4	+ 4.6	+ 0.2	+ 3.1	+ 10.8	+ 11.2	+ 7.8	+ 6.5	+ 3.0	+ 3.0	+ 2.9	+ 3.3	+ 5.7	+ 6.7	+ 6.7	+ 5.6	+ 4.3
15th	+ 2.8	+ 2.7	+ 2.4	+ 0.5	+ 0.6	+ 0.6	+ 0.7	+ 5.1	+ 8.4	+ 18.3	+ 11.5	+ 9.9	+ 10.4	+ 7.0	+ 3.9	+ 1.6	+ 1.3	+ 1.7	+ 2.6	+ 2.1	+ 2.8	+ 4.9	+ 5.0	+ 5.2
16th	+ 4.9	+ 3.9	+ 6.2	+ 3.6	+ 12.2	+ 8.3	+ 2.3	+ 2.0	+ 3.6	+ 11.8	+ 5.0	+ 5.9	+ 0.4	+ 2.8	+ 5.0	+ 4.8	+ 14.7	+ 13.7	+ 16.2	+ 21.5	+ 24.4	+ 21.3	+ 24.4	+ 26.3
17th	+ 27.8	+ 19.4	+ 24.5	+ 21.7	+ 23.5	+ 23.2	+ 25.5	+ 19.3	+ 13.2	+ 15.9	+ 8.1	—	+ 12.4	+ 14.9	+ 16.3	+ 16.7	+ 20.6	+ 19.8	+ 14.9	+ 15.1	+ 10.8	+ 15.4	+ 15.3	+ 13.5
18th	+ 15.0	+ 18.4	+ 14.8	+ 15.8	+ 14.0	+ 11.9	+ 14.0	+ 11.6	+ 7.1	+ 2.8	+ 1.0	+ 2.8	+ 3.4	+ 7.7	+ 9.8	+ 10.5	+ 13.0	+ 15.1	+ 9.0	+ 6.7	+ 7.7	+ 10.6	+ 10.8	+ 10.6
19th	+ 10.9	+ 10.6	+ 7.0	+ 6.6	+ 7.4	+ 6.7	+ 9.4	+ 7.0	+ 4.8	+ 5.1	+ 3.1	+ 3.1	+ 2.1	+ 4.2	+ 7.9	+ 5.3	+ 5.0	+ 5.4	+ 1.2	+ 0.9	+ 7.7	+ 7.1	+ 8.0	+ 7.3
20th	+ 12.2	+ 4.8	+ 1.2	+ 5.9	+ 2.3	+ 0.8	+ 9.0	+ 5.9	+ 0.2	+ 11.0	+ 6.8	+ 15.3	+ 8.3	+ 5.7	+ 1.2	+ 2.7	+ 2.5	+ 10.4	+ 2.7	+ 5.7	+ 8.4	+ 0.7	+ 3.4	+ 4.6
21st	+ 4.1	+ 7.4	+ 4.8	+ 4.3	+ 5.7	+ 3.3	+ 0.3	+ 0.6	+ 4.8	+ 8.4	+ 12.5	+ 12.6	+ 16.0	+ 12.2	+ 15.8	+ 4.4	+ 0.6	+ 1.4	+ 8.6	+ 7.7	+ 6.9	+ 1.7	+ 7.3	+ 0.2
22d	+ 3.5	+ 5.9	+ 5.8	—	—	—	+ 12.6	+ 10.2	+ 1.8	+ 0.8	+ 3.9	+ 7.0	+ 8.6	+ 9.8	+ 3.8	+ 0.1	+ 0.2	+ 4.2	+ 4.3	+ 3.8	+ 8.5	+ 8.8	+ 5.3	+ 5.8
23d	+ 6.1	+ 11.2	+ 7.9	+ 6.4	+ 6.5	+ 6.2	+ 7.0	+ 4.2	+ 1.0	+ 0.4	+ 2.3	+ 1.6	+ 5.9	+ 3.2	+ 1.5	+ 0.2	+ 2.1	+ 14.9	+ 26.5	+ 2.6	+ 1.7	+ 2.2	+ 1.9	+ 7.1
24th	+ 0.7	+ 1.6	+ 1.9	+ 0.3	+ 1.9	+ 1.9	+ 1.0	+ 1.7	+ 3.2	+ 6.2	+ 14.8	+ 16.4	+ 9.6	+ 7.9	+ 6.7	+ 12.1	+ 4.6	+ 2.0	+ 1.3	+ 3.1	+ 2.5	+ 4.2	+ 1.0	+ 0.0
25th	+ 0.4	+ 0.9	+ 2.4	+ 4.4	+ 2.4	+ 1.6	+ 3.1	+ 3.3	+ 0.8	+ 4.6	+ 10.5	+ 3.5	+ 2.0	+ 1.4	+ 0.7	+ 0.5	+ 4.3	+ 2.2	+ 4.1	+ 1.8	+ 1.3	+ 1.6	+ 5.2	+ 0.7
26th	+ 1.9	+ 3.7	+ 12.1	+ 22.5	+ 22.1	+ 8.0	+ 5.6	+ 15.0	+ 3.5	+ 1.3	+ 10.0	+ 5.4	+ 10.8	+ 5.3	+ 0.1	+ 1.7	+ 2.7	+ 0.7	+ 6.6	+ 5.0	+ 1.6	+ 1.7	+ 1.8	+ 2.0
27th	—	+ 1.3	+ 0.3	+ 0.8	+ 0.4	+ 2.2	+ 1.3	+ 7.9	+ 3.4	+ 6.4	+ 4.3	+ 11.4	+ 5.9	+ 7.7	+ 11.0	+ 11.3	+ 4.3	+ 1.1	+ 4.6	+ 1.7	+ 3.2	+ 4.6	+ 3.5	+ 3.6
28th	+ 3.8	+ 2.3	+ 3.2	+ 5.2	+ 6.0	+ 3.1	+ 3.6	+ 1.3	+ 0.1	+ 0.4	+ 1.4	+ 3.4	+ 4.1	+ 3.9	+ 1.6	+ 5.6	+ 2.8	+ 3.4	+ 1.9	+ 0.8	+ 1.3	+ 2.3	+ 1.1	+ 2.4
29th	+ 1.6	+ 2.4	+ 0.3	+ 1.4	+ 1.9	+ 3.6	+ 2.5	+ 3.2	+ 5.2	+ 6.5	+ 8.0	+ 2.6	+ 3.6	+ 0.3	+ 2.6	+ 5.5	+ 4.5	+ 0.3	+ 3.3	+ 2.2	+ 6.1	+ 4.7	+ 2.1	+ 1.1
30th	+ 5.2	+ 5.8	+ 3.7	+ 2.7	+ 0.7	+ 3.5	+ 0.7	+ 0.3	+ 0.2	+ 3.1	+ 6.5	+ 7.8	+ 5.2	+ 1.9	+ 3.6	+ 3.9	+ 2.4	+ 2.0	+ 7.1	+ 0.2	+ 3.6	+ 1.5	+ 6.6	+ 5.9
31st	+ 2.8	+ 2.0	+ 1.0	+ 4.9	+ 0.2	+ 1.6	+ 1.5	—	+ 2.8	+ 8.5	+ 6.2	+ 13.3	+ 7.8	+ 6.5	+ 5.2	+ 9.6	+ 9.6	+ 9.5	+ 10.5	+ 6.6	+ 10.8	+ 9.2	+ 7.6	+ 6.9
Means	+ 5.60	+ 5.68	+ 5.40	+ 4.55	+ 5.20	+ 5.38	+ 5.44	+ 3.66	+ 1.61	+ 1.55	+ 4.24	+ 4.81	+ 3.04	+ 1.15	+ 0.86	+ 1.66	+ 3.47	+ 4.24	+ 2.68	+ 4.46	+ 4.99	+ 5.50	+ 5.38	+ 5.64
Normals	+ 7.93	+ 7.17	+ 6.97	+ 6.04	+ 6.38	+ 7.37	+ 7.18	+ 6.04	+ 2.31	+ 0.52	+ 2.78	+ 3.57	+ 2.48	+ 0.81	+ 1.95	+ 1.97	+ 3.40	+ 5.02	+ 4.95	+ 5.14	+ 7.25	+ 7.48	+ 6.88	+ 7.13

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF FEBRUARY 1862.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 6.2	+ 0.2	+ 0.3	+ 1.6	+ 6.8	+ 4.6	- 1.7	- 7.2	- 3.2	- 4.1	- 1.1	- 7.9	- 6.6	- 9.8	- 3.0	+ 2.1	- 7.0	- 6.3	- 2.8	- 4.5	- 3.2	+ 2.1	- 3.3	- 2.1
2d	- 2.4	- 1.9	- 0.3	- 0.7	- 0.6	+ 0.3	- 5.9	- 2.1	- 4.1	- 3.4	- 11.2	- 9.6	- 11.9	- 9.9	- 2.8	- 3.8	- 0.2	- 0.4	+ 4.6	+ 6.7	+ 4.1	+ 6.3	+ 4.7	+ 7.8
3d	+ 2.9	+ 7.6	+ 7.5	+ 5.7	+ 2.5	+ 3.7	+ 1.4	+ 2.3	- 0.9	- 6.7	- 8.0	- 9.0	- 12.9	- 3.2	- 3.9	- 1.5	- 0.9	+ 1.5	+ 4.5	+ 3.2	+ 2.6	- 0.6	- 0.3	- 1.6
4th	+ 4.2	+ 2.0	+ 5.1	+ 1.9	+ 2.5	+ 0.1	+ 1.8	+ 6.2	+ 4.4	+ 0.4	+ 5.6	- 1.5	- 7.9	- 2.3	+ 0.8	+ 4.3	+ 4.8	+ 3.2	+ 4.4	+ 4.6	+ 4.6	+ 5.4	+ 4.8	+ 3.9
5th	+ 6.1	+ 5.3	+ 3.9	+ 5.4	+ 4.4	+ 4.7	+ 2.2	+ 3.0	+ 2.0	+ 0.3	- 2.8	- 4.0	- 2.4	- 5.3	- 3.6	+ 2.5	+ 6.6	+ 3.9	+ 1.9	+ 5.6	+ 5.6	+ 5.8	+ 7.0	+ 5.8
6th	+ 6.2	+ 5.5	+ 5.0	+ 4.4	+ 5.1	+ 5.2	+ 8.9	+ 8.5	+ 7.9	+ 6.6	+ 5.2	+ 5.2	+ 5.6	+ 3.9	+ 6.4	+ 3.1	+ 5.1	+ 7.0	+ 7.5	+ 8.0	+ 8.3	+ 9.8	+ 6.0	+ 4.2
7th	+ 2.9	+ 5.3	+ 1.7	+ 1.2	+ 2.0	+ 2.6	+ 3.5	+ 2.4	+ 1.7	- 0.4	- 2.1	- 3.3	- 2.6	- 1.5	- 1.1	- 0.3	+ 2.4	+ 2.3	+ 2.3	0.0	+ 1.1	+ 2.5	+ 3.6	+ 3.3
8th	+ 4.2	+ 4.8	+ 5.5	+ 5.1	+ 5.2	+ 1.8	+ 2.6	+ 3.9	+ 2.9	+ 0.7	- 2.3	- 5.3	- 4.7	- 6.4	- 6.1	- 2.0	+ 0.4	+ 0.4	+ 1.1	+ 1.5	+ 1.2	+ 0.7	+ 3.1	+ 1.1
9th	+ 0.8	+ 0.3	+ 1.0	+ 1.0	+ 1.7	+ 2.3	+ 3.2	+ 3.0	+ 0.6	- 1.3	- 2.8	- 4.2	- 4.6	- 4.8	- 4.6	- 2.5	- 1.1	+ 0.1	- 0.1	- 0.6	+ 0.8	+ 1.6	+ 2.0	+ 2.4
10th	-	-	-	-	-	-	+ 5.5	+ 5.9	+ 3.7	- 1.4	- 3.4	- 2.6	-	-	- 5.9	- 8.1	-	-	- 3.4	+ 0.6	+ 2.2	+ 2.4	+ 1.9	+ 2.3
11th	+ 2.7	+ 2.6	+ 3.0	+ 3.1	+ 3.0	+ 3.2	+ 3.1	+ 2.4	+ 2.0	- 0.3	-	-	-	-	- 5.1	-	-	-	+ 2.0	+ 2.3	+ 2.7	+ 3.6	+ 3.8	+ 3.6
12th	+ 3.6	+ 3.9	+ 4.4	+ 4.3	+ 5.0	+ 4.4	+ 4.7	+ 3.6	+ 2.7	+ 1.9	-	-	-	- 1.6	-	-	-	-	-	+ 2.8	+ 2.9	+ 6.4	+ 2.2	+ 1.6
13th	+ 1.6	+ 2.2	+ 3.3	+ 5.1	+ 6.6	+ 5.5	+ 4.8	+ 2.0	+ 0.1	-	-	-	-	-	- 1.3	-	-	-	+ 2.5	+ 3.3	+ 1.8	+ 3.0	+ 3.5	+ 5.0
14th	+ 6.9	+ 3.5	+ 3.1	+ 4.3	+ 5.0	+ 0.8	+ 8.0	+ 7.4	+ 13.4	0.0	- 4.8	- 7.3	- 6.4	- 4.3	- 2.0	- 0.1	+ 0.1	+ 0.4	+ 1.3	+ 3.3	+ 2.8	+ 4.2	+ 3.4	+ 3.6
15th	+ 4.4	+ 3.9	+ 4.2	+ 7.0	+ 5.3	+ 1.9	+ 3.8	+ 3.3	+ 2.8	+ 0.5	- 1.8	- 1.5	0.0	+ 1.1	+ 1.8	-	-	+ 6.2	+ 6.2	+ 5.0	+ 5.7	+ 6.4	+ 5.3	+ 6.2
16th	+ 5.9	+ 7.0	+ 6.8	+ 6.3	+ 6.6	+ 6.8	+ 7.8	+ 8.2	+ 4.6	+ 3.1	+ 0.4	- 1.2	- 2.0	+ 0.2	+ 4.8	+ 6.9	+ 6.9	+ 7.2	+ 6.8	+ 6.6	+ 7.0	+ 7.1	+ 7.1	+ 7.4
17th	+ 7.3	+ 7.8	+ 8.1	+ 8.7	+ 8.9	+ 8.6	+ 9.1	+ 7.9	+ 4.0	+ 1.2	- 3.7	-	-	- 3.6	+ 0.6	+ 4.2	+ 4.8	-	+ 6.8	+ 6.2	+ 6.4	+ 6.7	+ 8.1	+ 8.1
18th	+ 8.2	+ 8.1	+ 8.1	+ 8.3	+ 8.2	+ 8.8	+ 8.4	+ 8.7	+ 6.2	+ 3.1	+ 1.6	- 0.5	- 2.0	- 1.7	+ 1.7	+ 4.2	+ 5.8	+ 6.6	+ 6.3	+ 7.8	+ 8.2	+ 8.9	+ 9.0	+ 8.8
19th	+ 8.8	+ 8.5	+ 8.6	+ 8.3	+ 8.7	+ 9.3	+ 9.7	+ 10.7	+ 9.3	+ 6.7	+ 4.2	+ 3.4	+ 1.1	+ 3.4	+ 6.4	+ 7.0	+ 6.0	+ 8.0	+ 9.3	+ 5.5	+ 9.3	+ 9.6	+ 9.9	+ 9.8
20th	+ 9.7	+ 9.4	+ 9.2	+ 9.2	+ 8.9	+ 8.5	+ 9.2	+ 9.7	+ 8.0	+ 5.0	+ 0.4	- 2.9	- 5.3	- 2.3	+ 3.7	+ 9.3	+ 7.8	+ 5.7	+ 6.4	+ 8.2	+ 8.5	+ 8.3	+ 5.3	+ 9.8
21st	+ 6.2	+ 6.1	+ 6.6	+ 6.2	+ 6.5	+ 6.8	+ 7.8	+ 9.7	+ 10.1	+ 7.5	+ 4.4	+ 1.6	- 0.2	+ 0.7	+ 2.1	+ 3.8	+ 3.9	+ 6.7	+ 7.0	+ 2.0	+ 0.1	- 5.8	+ 0.8	+ 0.6
22d	+ 2.9	+ 6.8	+ 1.1	+ 1.9	- 3.0	+ 5.8	- 0.8	- 2.0	+ 0.2	- 1.8	- 8.5	- 7.3	- 7.3	- 9.5	- 8.1	- 7.3	- 4.1	- 1.5	- 0.5	- 0.2	+ 0.8	+ 0.5	+ 1.0	+ 0.6
23d	+ 1.2	+ 1.4	+ 0.6	+ 0.7	+ 0.6	+ 1.1	+ 2.4	+ 3.9	+ 3.4	+ 0.5	- 3.8	- 9.3	- 8.5	- 8.4	- 8.9	- 7.6	- 7.4	- 6.0	- 5.5	- 4.8	- 4.1	- 3.3	- 3.3	- 3.1
24th	- 2.2	- 2.9	- 2.7	- 3.3	- 4.2	- 4.6	- 4.5	- 4.9	- 5.6	- 6.6	- 6.9	- 6.8	- 6.8	- 5.6	- 4.5	- 3.6	- 2.5	- 1.5	- 1.2	- 1.3	- 1.6	- 0.9	- 1.4	- 1.1
25th	- 0.8	- 0.3	- 0.5	- 0.3	0.0	0.0	+ 0.6	+ 0.5	- 1.3	- 3.3	- 6.3	- 7.2	- 7.2	- 5.0	- 2.9	- 1.5	- 0.3	0.0	- 0.2	- 0.6	- 0.6	0.0	+ 0.7	+ 0.4
26th	+ 0.6	+ 1.1	+ 0.8	+ 1.0	+ 1.5	+ 1.9	+ 2.1	+ 1.7	- 0.1	- 3.5	- 6.8	- 8.1	- 8.4	- 6.8	- 6.0	- 1.3	+ 1.0	+ 1.0	+ 0.7	+ 1.7	+ 2.2	+ 2.4	+ 2.3	+ 2.6
27th	+ 2.8	+ 2.7	+ 2.9	+ 3.0	+ 2.6	+ 3.3	+ 3.4	+ 3.0	+ 1.8	- 1.0	- 4.0	- 5.7	- 5.3	- 4.5	- 2.9	- 0.1	+ 1.6	+ 3.2	+ 4.4	+ 4.8	+ 5.6	+ 6.0	+ 5.6	+ 5.2
28th	+ 4.9	+ 4.8	+ 4.9	+ 5.6	+ 5.6	+ 5.2	+ 5.4	+ 5.2	+ 3.2	- 0.5	- 4.1	- 5.2	- 3.2	- 1.8	+ 2.6	+ 5.6	+ 6.6	+ 6.1	+ 6.7	+ 2.1	+ 3.3	- 0.9	0.0	- 1.4
Means	+ 3.92	+ 3.91	+ 3.79	+ 3.89	+ 3.90	+ 3.80	+ 3.80	+ 3.82	+ 2.85	+ 0.12	- 2.95	- 4.17	- 4.76	- 3.67	- 1.63	+ 0.93	+ 1.75	+ 2.34	+ 2.93	+ 2.85	+ 3.15	+ 3.51	+ 3.31	+ 3.39
Normals	+ 3.92	+ 4.18	+ 4.03	+ 4.17	+ 4.50	+ 4.12	+ 4.50	+ 4.33	+ 2.47	+ 0.20	- 3.64	- 5.26	- 4.51	- 4.28	- 1.44	+ 1.35	+ 2.94	+ 3.15	+ 3.52	+ 3.43	+ 3.67	+ 4.13	+ 3.58	+ 3.63

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF MARCH 1862.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.9	+ 2.0	+ 2.6	+ 2.6	+ 8.4	+ 5.4	+ 5.3	0.0	- 2.4	- 1.7	-18.4	-17.7	-15.8	-14.1	- 9.3	- 6.8	- 5.2	- 4.8	- 5.5	- 3.8	- 4.0	- 4.1	- 2.8	- 2.5
2d	- 1.6	- 1.8	- 1.7	- 0.8	- 1.2	- 0.7	- 0.8	- 0.9	- 2.4	- 7.6	-13.2	-16.7	-16.1	-11.6	- 8.3	- 6.1	- 5.0	- 3.8	- 4.4	- 2.7	- 2.4	- 1.9	- 0.9	- 1.0
3d	- 1.5	- 1.2	- 1.4	- 1.3	- 1.6	- 1.1	- 0.9	- 1.5	- 4.1	- 7.9	-11.3	-11.9	-10.1	- 7.7	- 4.8	- 4.0	- 3.5	- 3.7	- 3.2	- 2.4	- 1.6	- 1.8	- 1.5	- 1.1
4th	+ 0.3	- 0.4	- 1.9	- 1.1	- 0.6	- 0.3	+ 0.1	+ 0.1	- 2.2	- 5.9	- 9.8	-12.3	-12.5	- 9.8	- 6.2	- 4.9	- 4.5	- 3.2	- 4.0	- 4.2	- 5.6	- 5.5	- 2.6	- 3.5
5th	- 4.7	- 2.3	- 2.2	- 1.6	- 1.2	- 0.8	+ 0.2	- 1.5	- 3.5	- 6.9	- 8.0	- 6.9	- 5.7	- 4.2	- 2.7	- 1.6	- 1.0	- 0.3	+ 0.5	+ 1.5	+ 2.2	+ 2.7	+ 2.3	+ 2.5
6th	+ 2.5	+ 2.5	+ 1.9	+ 2.3	+ 2.2	+ 2.4	+ 2.4	+ 2.7	+ 1.5	- 1.1	- 2.4	-	+ 0.6	+ 2.3	+ 5.7	+ 5.1	+ 5.5	+ 4.5	+ 3.3	+ 2.5	- 1.8	- 4.9	- 8.2	+ 3.3
7th	- 5.0	- 5.3	- 5.0	- 0.2	- 1.3	- 0.7	+ 0.5	- 2.8	- 9.0	- 8.5	-11.7	-13.7	-14.4	-13.5	- 8.2	- 8.4	- 7.5	- 3.4	- 3.7	- 0.2	- 0.1	- 1.3	- 0.7	+ 1.5
8th	+ 0.7	+ 3.0	+ 3.9	+ 3.9	+ 4.4	+ 4.0	+ 0.6	+ 1.3	- 0.4	- 2.5	- 5.8	- 6.4	- 5.3	- 3.3	- 1.4	+ 0.4	- 0.5	+ 0.9	+ 2.1	+ 1.0	+ 4.4	+ 3.4	+ 3.9	+ 4.0
9th	+ 5.6	+ 4.1	+ 4.3	+ 4.3	+ 6.2	+ 4.0	+ 4.6	+ 3.7	+ 1.7	- 1.5	- 4.4	- 4.2	- 2.7	- 2.6	- 3.6	- 1.7	+ 8.6	- 3.6	- 2.3	- 3.3	- 2.7	- 1.7	- 0.6	- 0.9
10th	+ 3.6	+ 1.5	+ 2.1	+ 1.4	+ 0.9	+ 2.4	+ 2.0	+ 1.4	+ 0.4	- 1.8	- 4.0	- 5.5	- 5.0	- 3.6	- 3.6	- 3.0	- 2.4	- 1.6	- 0.2	+ 0.2	+ 1.0	+ 1.1	+ 2.1	+ 2.7
11th	+ 4.8	+ 2.7	+ 3.6	+ 3.7	+ 3.3	+ 2.8	+ 1.0	+ 0.4	- 1.1	- 2.8	- 4.1	- 5.3	- 4.3	- 3.3	- 2.1	+ 0.2	+ 0.8	+ 0.8	+ 1.2	+ 2.0	+ 2.4	+ 2.0	+ 1.8	+ 2.1
12th	+ 3.0	+ 2.5	+ 2.7	+ 4.2	+ 3.6	+ 4.2	+ 4.6	+ 4.3	+ 3.4	0.0	- 1.9	- 4.3	- 4.4	- 4.1	- 1.5	- 0.8	- 2.0	- 0.4	- 4.6	- 6.5	- 7.1	- 6.3	+ 2.3	- 3.5
13th	- 1.7	- 0.2	+ 5.2	+ 2.4	+ 2.2	- 0.8	+ 4.2	+ 1.9	- 0.3	- 2.9	- 6.7	- 8.6	- 7.5	- 5.8	- 2.7	- 0.4	+ 1.0	- 0.3	- 1.2	- 1.1	+ 0.1	+ 0.5	+ 0.6	+ 1.6
14th	+ 3.1	+ 4.2	+ 2.5	+ 2.8	+ 3.2	+ 3.5	+ 2.7	+ 4.3	+ 2.0	0.0	- 2.6	- 3.7	- 3.7	- 2.4	- 0.7	+ 2.4	+ 3.4	+ 4.2	+ 4.5	+ 5.0	+ 5.0	+ 5.1	+ 4.5	+ 4.5
15th	+ 4.7	+ 4.6	+ 4.9	+ 5.1	+ 5.2	+ 5.8	+ 5.8	+ 5.6	+ 4.2	+ 1.4	- 2.4	- 5.8	- 4.1	- 2.4	+ 0.2	+ 2.6	+ 3.8	+ 4.8	+ 4.8	+ 5.6	+ 6.5	+ 6.7	+ 6.1	+ 7.1
16th	+ 6.8	+ 7.5	+ 9.7	+ 6.7	+ 7.6	+ 7.8	+ 6.8	+ 7.1	+ 5.7	+ 3.7	0.0	- 2.6	- 2.7	- 2.0	+ 0.5	+ 2.2	+ 3.7	+ 4.2	+ 5.3	+ 4.9	+ 6.1	+ 6.0	+ 5.3	+ 4.3
17th	+ 5.8	+ 7.5	+ 6.3	+ 6.2	+ 6.7	+ 7.8	+ 8.2	+ 8.4	+ 7.4	+ 5.8	+ 3.6	+ 1.9	+ 1.0	+ 3.5	+ 2.5	+ 2.8	+ 1.9	+ 0.4	- 3.5	- 2.3	- 2.0	- 0.2	+ 3.9	+ 5.5
18th	+10.9	+ 5.7	+ 3.3	+ 4.1	+ 4.7	+ 5.0	+ 5.0	+ 5.0	+ 4.1	+ 1.0	- 2.0	- 2.7	- 2.2	- 0.6	+ 1.8	+ 7.5	+ 5.1	+ 7.9	+ 6.6	+ 6.8	+ 7.1	+ 6.9	+ 2.8	+ 4.3
19th	+ 6.2	+ 6.6	+ 6.2	+ 6.3	+ 7.5	+ 6.7	+ 6.2	+ 5.3	+ 4.1	+ 0.5	- 1.8	- 1.9	- 1.8	- 3.0	- 0.2	+ 2.3	+ 3.5	+ 5.6	+ 5.9	+ 8.3	+ 0.9	+ 1.9	+ 1.2	+ 3.2
20th	+ 1.1	+ 3.6	+ 4.1	+ 4.6	+ 5.5	+ 5.3	+ 5.2	+ 4.6	+ 1.9	+ 0.1	- 2.6	- 6.7	- 4.9	- 1.3	- 0.2	+ 1.9	+ 1.7	+ 4.2	+ 4.0	+ 4.6	+ 3.7	+ 2.2	+ 3.9	+ 6.0
21st	+10.1	+ 9.6	+ 6.6	+ 6.4	+ 6.9	+ 6.8	+ 7.2	+ 6.2	+ 5.4	+ 3.2	+ 0.6	- 0.2	- 0.2	- 0.1	+ 2.9	+ 5.5	+ 5.6	+ 5.4	+ 6.2	+ 7.0	+ 8.0	+ 6.5	+ 7.1	+10.4
22d	+ 6.5	+ 3.5	+ 4.6	+ 8.6	+ 5.5	+ 6.2	+ 5.3	+ 4.7	+ 3.7	+ 2.0	+ 0.3	+ 0.2	+ 1.3	- 3.6	+ 2.5	+ 5.8	+ 7.0	+ 7.2	+ 7.6	+ 8.2	+ 7.7	+ 7.9	+ 8.2	+ 8.0
23d	+ 8.3	+ 8.0	+ 7.7	+ 7.7	+ 8.1	+ 8.5	+10.0	+ 9.8	+ 9.4	+ 8.0	+ 6.5	+ 6.3	+ 7.1	+ 8.6	+ 9.5	+10.2	+10.9	+ 9.9	+ 8.3	+ 4.7	-	+ 7.9	+ 9.5	+ 9.7
24th	+14.1	+10.0	+10.2	+ 9.8	+ 8.9	+10.5	+10.0	+10.3	+ 9.9	+ 8.5	+ 8.0	+ 6.1	+ 5.1	+ 6.2	+ 7.5	+ 9.8	+10.5	+11.0	+11.8	+11.7	+12.0	+12.8	+11.6	+11.9
25th	+13.6	+12.5	+12.1	+12.0	+12.3	+12.5	+12.6	+12.3	+11.7	+10.6	+ 8.1	+ 6.6	+ 5.1	+ 5.4	+ 6.0	+ 7.6	+ 8.4	+ 9.1	+ 9.4	+10.3	+10.1	+10.7	+12.6	+12.6
26th	+12.1	+13.6	+12.3	+12.5	+12.8	+13.2	+14.1	+13.9	+14.3	-	+ 9.2	+ 6.9	+ 6.4	+ 8.6	+ 8.5	+ 9.6	+ 9.4	+ 9.3	+10.0	+ 7.9	+ 9.5	+ 8.0	+ 7.1	-
27th	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28th	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29th	-	-	-	-	-	-	-	-	-	-	-	+ 7.6	+ 7.4	+ 7.7	+ 9.0	+ 9.9	+10.8	+10.9	+11.0	+11.9	+10.6	+13.4	+13.4	+13.2
30th	+12.3	+12.7	+11.8	+12.6	+12.7	+11.1	+12.4	+13.5	+12.0	+10.4	+ 9.4	+ 8.3	+ 7.6	+ 9.8	+12.2	+14.3	+14.4	+14.9	-	+13.9	+13.2	+13.2	+14.4	+14.8
31st	+15.6	+14.8	+15.2	+15.8	+14.1	+14.3	+14.5	+14.2	+13.4	+ 6.1	+ 4.2	+ 3.3	+ 6.6	+ 3.1	+ 4.2	+ 4.8	+ 6.1	+ 6.0	+ 6.9	+ 7.3	+ 8.6	+ 8.0	+ 7.9	-
Means	+ 4.97	+ 4.68	+ 4.84	+ 5.04	+ 5.25	+ 5.21	+ 5.35	+ 4.80	+ 3.24	+ 0.38	- 2.33	- 3.21	- 2.59	- 1.51	+ 0.60	+ 2.32	+ 3.12	+ 3.31	+ 2.74	+ 3.41	+ 3.17	+ 3.42	+ 3.99	+ 4.47
Normals	+4.29	+4.16	+4.75	+3.81	+4.45	+3.66	+4.01	+3.31	+1.93	+0.19	-2.60	-3.92	-3.04	-2.16	+0.14	+2.01	+3.48	+3.78	+2.65	+3.28	+2.65	+3.32	+3.52	+3.54

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF APRIL 1862.

Value of a part of division = 0.0001,84.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 4.8	+ 5.3	+ 5.2	+ 5.2	+ 6.2	+ 7.0	+ 6.8	+ 7.1	+ 6.4	+ 5.1	+ 4.3	+ 2.6	+ 1.1	+ 3.1	+ 4.1	+ 5.3	+ 5.8	+ 5.5	+ 5.6	+ 3.6	+ 5.1	+ 4.8	+ 4.4	+ 3.6
2d	+ 3.9	+ 4.8	+ 5.5	+ 5.4	+ 8.0	+ 7.0	+ 6.9	+ 4.2	+ 6.5	+ 4.3	- 1.0	- 1.8	- 0.3	- 3.2	- 2.1	+ 0.6	- 0.1	- 1.6	+ 3.0	+ 2.7	+ 4.5	+ 4.2	+ 0.5	- 4.3
3d	+ 2.6	- 0.4	+ 3.2	- 1.5	0.0	+ 2.3	- 4.1	- 4.8	- 2.0	- 5.7	-14.3	- 9.2	- 8.4	- 7.2	- 6.0	- 3.6	- 3.1	- 3.2	- 0.8	- 0.7	0.0	+ 3.2	+ 2.4	+ 0.4
4th	+ 1.2	+ 2.2	- 0.1	- 1.0	+ 0.7	- 1.8	+ 1.9	+ 1.9	+ 0.4	- 3.5	- 4.1	- 7.3	- 6.4	- 7.5	- 7.4	- 5.4	- 3.8	- 2.3	- 0.7	- 0.3	+ 4.6	+ 5.1	+ 2.1	+ 2.3
5th	+ 3.3	+ 4.0	+ 4.5	+ 3.9	+ 4.0	+ 3.7	+ 3.5	+ 2.8	+ 2.5	+ 0.6	- 3.8	- 4.9	- 4.3	- 0.4	+ 0.3	- 0.1	+ 0.9	+ 0.3	+ 0.7	- 1.0	+ 0.3	+ 3.3	+ 3.2	+ 3.6
6th	+ 4.2	+ 3.5	+ 3.8	+ 3.7	+ 4.0	+ 5.2	+ 4.0	+ 3.2	+ 2.6	- 1.5	- 0.6	- 2.4	+ 0.1	- 0.4	+ 2.2	+ 2.1	+ 1.6	+ 2.3	+ 2.3	+ 3.5	+ 4.1	+ 4.1	+ 3.9	+ 3.8
7th	+ 3.6	+ 3.9	+ 4.9	+ 5.6	+ 5.1	+ 4.5	+ 4.6	+ 4.6	+ 3.3	+ 1.6	- 1.0	- 2.5	- 1.4	+ 1.4	+ 3.0	+ 4.1	+ 4.4	+ 4.6	-	+ 6.4	+ 6.1	+ 5.6	+ 5.9	+ 5.9
8th	+ 6.2	+ 5.1	+ 5.3	+ 5.6	+ 5.4	+ 5.4	+ 5.4	+ 6.3	+ 6.9	+ 5.1	+ 3.3	+ 2.3	+ 1.6	+ 1.8	+ 3.3	+ 4.4	+ 5.1	+ 5.3	+ 6.1	+ 6.0	+ 6.6	+ 6.9	+ 6.6	+ 6.5
9th	+ 7.0	+ 7.0	+ 7.7	+ 7.9	+ 8.3	+ 7.5	+ 7.9	+ 8.1	+ 8.1	+ 7.0	+ 4.9	+ 2.6	+ 0.9	+ 2.1	+ 4.7	+ 5.5	+ 5.8	+ 7.0	+ 7.6	+ 7.2	+ 7.2	+ 7.6	+ 7.6	+ 6.6
10th	+ 8.3	+ 8.7	+ 9.0	+ 9.1	+ 9.2	+ 9.6	+10.4	+ 9.9	+ 9.1	+ 6.6	+ 3.9	+ 3.6	+ 3.0	+ 4.1	+ 5.2	+ 6.1	+ 5.5	+ 5.6	+ 4.6	+ 2.5	- 1.5	- 3.7	- 4.2	- 1.7
11th	+ 1.5	+ 2.9	+ 3.9	+ 6.1	+ 5.1	+ 5.8	+ 5.4	+ 6.8	+ 5.9	+ 4.0	+ 0.3	+ 1.0	- 2.0	- 1.8	- 1.2	+ 2.6	- 6.7	- 9.2	-11.1	- 9.3	- 5.3	- 7.1	- 6.4	- 7.3
12th	- 6.0	- 4.2	- 1.9	- 1.7	+ 0.5	- 2.4	+ 0.2	+ 1.5	0.0	- 1.0	- 5.8	- 2.6	- 2.5	- 1.2	- 1.1	- 1.9	- 4.6	- 0.4	+ 1.1	+ 2.0	+ 4.7	+ 3.5	+ 2.6	+ 3.2
13th	+ 3.7	+ 3.8	+ 4.2	+ 4.3	+ 4.5	+ 4.8	+ 5.5	+ 7.9	+ 7.5	+ 5.0	+ 2.3	+ 5.0	+ 3.9	+ 3.8	+ 2.6	+ 2.0	+ 3.0	+ 4.0	+ 4.7	+ 5.4	+ 4.1	+ 4.6	+ 4.6	+ 4.9
14th	+ 5.5	+ 6.2	+ 6.3	+ 6.7	+ 7.1	+ 7.2	+ 7.7	+ 8.2	+ 6.1	+ 3.9	+ 1.5	+ 0.1	- 0.9	- 1.0	+ 0.1	+ 1.5	+ 2.5	+ 3.3	+ 3.6	+ 3.8	+ 3.8	+ 4.1	+ 4.4	+ 4.2
15th	+ 4.0	+ 4.1	+ 6.5	+ 1.0	+ 2.3	+ 3.1	+ 2.4	+ 2.7	+ 1.0	- 3.3	- 8.4	- 7.5	- 6.1	- 3.5	- 1.9	- 1.0	- 3.1	- 7.7	- 4.4	- 2.4	- 1.4	- 1.6	- 1.8	- 0.4
16th	- 0.6	- 1.1	- 0.6	- 1.0	+ 0.3	+ 1.9	+ 2.1	+ 1.7	+ 1.3	+ 0.9	- 0.2	+ 0.4	- 4.6	- 5.3	+ 0.9	+ 0.1	- 1.3	- 6.4	- 7.1	- 1.5	- 1.3	+ 5.5	+ 1.2	+ 0.4
17th	+ 3.3	+ 3.4	+ 2.7	+ 3.0	+ 2.3	+ 2.2	+ 3.3	+ 2.7	+ 3.1	+ 0.9	- 2.6	- 3.2	- 4.7	- 7.1	- 0.6	- 0.9	0.0	- 1.0	+ 4.6	+ 3.7	+ 4.9	+ 5.6	+ 4.9	+ 4.7
18th	+ 4.8	+ 7.2	+ 5.9	+ 5.4	+ 5.2	+ 5.8	+ 6.0	+ 6.6	+ 5.8	+ 5.3	+ 4.5	+ 1.6	+ 0.5	+ 1.0	+ 3.3	+ 3.5	+ 4.7	+ 5.5	+ 5.8	+ 6.1	+ 6.5	+ 6.5	+ 7.3	+ 7.4
19th	+ 6.5	+ 6.6	+ 6.7	+ 6.7	+ 6.6	+ 6.8	+ 6.9	+ 7.9	+ 8.3	+ 6.9	+ 5.1	+ 3.1	+ 2.4	+ 2.7	+ 3.2	+ 4.9	+ 6.0	+ 6.2	+ 6.3	+ 7.5	+ 7.1	+ 7.7	+ 8.5	+ 7.8
20th	+ 8.2	+ 8.3	+ 7.8	+ 7.9	+ 8.3	+ 8.7	+ 8.7	+ 8.8	+ 8.2	+ 7.0	+ 5.2	+ 4.3	+ 4.6	+ 5.4	+ 7.2	+ 8.4	+ 9.0	+ 9.1	+ 8.8	+ 9.6	+ 9.5	+ 9.5	+10.1	+10.2
21st	+10.4	+ 9.9	+10.0	+10.6	+10.7	+10.4	+11.3	+12.2	+11.6	+10.9	+ 9.8	+ 7.4	+ 5.8	+ 4.5	+ 6.1	+ 7.4	+ 7.8	+ 8.0	+ 8.4	+10.6	+10.4	+10.2	+ 4.0	+ 6.3
22d	+ 5.0	+ 6.7	+ 7.8	+ 7.5	+ 9.0	+ 8.5	+10.4	+10.9	+11.4	+ 7.0	+ 3.8	+ 6.4	+ 3.4	+ 2.7	+ 2.4	+ 3.6	+ 0.5	+ 0.4	+ 5.4	+ 5.7	+ 2.9	+ 7.9	+ 6.2	+ 6.1
23d	+12.8	+ 9.0	+ 4.6	+ 4.7	+ 6.0	+ 6.3	+ 7.8	+ 8.9	+ 9.7	+ 7.9	+ 4.4	+ 1.6	+ 1.6	+ 1.3	+ 1.6	+ 1.3	- 1.8	- 1.7	- 0.4	+ 7.2	+ 4.6	+ 4.3	+ 5.3	+ 7.6
24th	+ 9.8	+10.7	+15.0	+14.1	+13.7	+14.2	+15.3	+15.8	+14.0	+11.7	+11.3	+ 8.7	+ 6.2	+ 8.4	+ 1.6	+ 0.4	+ 1.8	+ 2.0	+ 2.1	+ 2.8	+ 4.3	- 0.4	+ 6.4	+10.2
25th	+ 7.3	+11.2	+12.0	+11.7	+ 7.7	+10.1	+ 9.7	+10.7	+ 9.4	+10.0	+11.8	+ 9.4	+11.0	- 0.5	- 3.0	- 1.7	- 1.9	- 1.0	+ 4.7	+ 3.9	+ 3.4	- 0.6	+ 2.0	+ 2.9
26th	+15.1	+15.4	+ 9.2	+ 9.6	+ 7.5	+ 9.3	+ 9.3	- 1.3	+ 4.0	+12.8	+ 1.3	- 5.7	- 5.1	- 2.1	- 0.9	- 0.5	+ 1.9	+ 2.3	+ 3.0	+ 3.5	+ 3.5	+ 2.4	+ 5.3	+ 7.3
27th	+ 5.5	+ 4.9	+ 1.7	+ 1.5	+ 0.7	+11.2	+ 8.0	+ 3.1	+10.0	+10.1	- 0.6	+ 1.6	+ 0.3	+ 2.3	+ 7.4	+ 4.0	+ 5.1	+ 0.1	+ 7.4	+ 6.5	+11.6	+ 8.1	+ 9.1	- 1.4
28th	+12.7	+14.6	+13.5	+13.9	+15.9	+18.7	+16.1	+13.3	+11.2	+11.2	+14.5	- 9.6	- 7.6	-12.7	- 1.9	- 7.1	-10.7	- 6.7	-14.5	-14.2	-14.9	- 9.0	-10.0	- 2.5
29th	- 1.7	- 0.3	+ 2.2	0.0	+ 0.2	- 1.8	+ 4.0	+ 1.0	- 1.9	-10.1	-14.5	-21.1	-17.9	-18.8	-22.9	- 8.1	- 5.4	-16.1	-10.3	-10.5	- 4.9	- 7.4	- 8.1	- 3.9
30th	- 2.6	- 0.4	+ 1.4	+ 3.4	+ 3.3	+ 4.8	+ 6.1	- 9.5	-16.0	-19.1	-28.3	-37.6	-38.5	-27.9	-27.9	-27.1	-28.5	-32.6	-32.4	-	-	-31.9	-30.5	-34.9
Means	+ 5.01	+ 5.43	+ 5.60	+ 5.31	+ 5.59	+ 6.20	+ 6.45	+ 5.44	+ 5.15	+ 3.40	+ 0.23	- 1.79	- 2.14	- 1.87	0.59	+ 0.35	+ 0.01	- 0.61	+ 0.49	+ 2.28	+ 3.13	+ 2.12	+ 1.91	+ 1.98
Normals	+5.00	+5.32	+5.08	+4.91	+4.94	+6.36	+6.16	+5.73	+5.95	+4.06	+1.14	+0.09	-1.18	+0.52	+1.12	+1.75	+1.45	+1.50	+3.25	+3.38	+3.91	+4.47	+4.03	+3.73

FLAGSTAFF OBSERVATORY

85

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JULY 1862.

Value of a part of division = 0.0001,16.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+34.5	+35.4	+39.8	+37.1	+29.6	+24.4	+23.6	—	+18.6	+13.9	+13.8	+20.0	+20.5	+16.3	+4.8	-13.3	-16.7	-15.8	-16.0	-15.8	-15.3	-3.9	+1.9	+5.7
2d	+14.8	+15.2	+68.1	+20.9	+25.6	+25.6	+26.1	+21.1	+20.8	+14.7	+23.9	+9.6	+17.5	+18.3	+12.8	+3.3	+2.0	—	—	—	—	—	—	—
3d	—	—	—	—	—	—	—	—	+15.6	+15.5	+15.4	+15.2	+15.5	+17.4	+23.9	+28.4	+18.3	-8.8	-32.6	-29.2	-32.8	-33.8	-35.4	-34.8
4th	-33.2	-32.6	-22.6	-32.8	-30.6	-29.4	-28.8	-30.4	-25.7	-25.8	-25.8	—	-5.4	-8.4	-7.0	-5.6	-4.6	+1.5	+8.4	-2.5	+5.3	+6.7	+9.5	+11.8
5th	+7.7	+6.5	+3.1	+6.6	+6.6	+4.8	+2.9	+2.3	+2.9	-7.4	-7.6	-10.0	-10.9	-14.7	-12.0	-8.8	-10.7	-11.8	-13.4	-15.5	-8.8	+4.8	—	—
6th	—	—	—	—	—	+14.8	+15.7	+1.9	+4.5	+6.4	+10.0	+6.6	+6.4	+5.8	+5.4	+6.6	+8.6	+11.8	+13.1	+14.8	+15.6	+18.4	+18.4	+19.2
7th	+19.0	+18.1	+18.0	+17.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
8th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
9th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10th	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	-0.8	-7.5	-4.6	-2.3	-1.5	-0.6	—
11th	+1.6	-1.0	-0.5	+1.1	+4.7	+1.7	+0.8	+1.4	+3.0	+2.3	—	-1.0	-3.8	-4.4	-5.3	-3.8	-3.0	-1.0	-0.6	+2.3	-2.0	-1.3	+0.2	+2.0
12th	+0.7	+0.4	-1.1	-0.8	+0.4	+0.4	+0.9	+1.8	+2.8	+3.7	+2.2	-2.6	-2.2	-5.9	-6.2	-1.2	+1.2	+1.3	+1.5	+0.8	+2.6	+1.1	+4.5	+1.4
13th	+2.1	+3.3	+3.5	+2.7	+2.5	+2.4	+4.2	+4.1	+4.0	+2.7	-0.9	-0.1	-1.4	-1.0	0.0	+1.3	+3.5	+4.8	+3.5	+3.5	+4.3	+2.7	+2.0	+3.8
14th	-5.5	-6.2	+5.5	+2.6	—	+5.6	+5.5	+5.6	+5.3	+4.1	+1.0	+0.4	+0.2	+3.1	-4.3	-2.5	+1.4	+1.4	+2.6	+1.8	+1.4	-0.4	+0.6	+0.9
15th	+3.6	+6.7	+4.1	+1.8	+2.6	+3.0	+2.8	+2.7	+2.9	+1.9	+1.5	-0.1	-1.5	-2.0	-1.7	-0.9	+0.4	+1.6	+2.8	+3.7	+1.0	+3.4	+2.6	+3.4
16th	+3.5	+1.0	+3.1	+4.9	+4.0	+4.6	+3.5	+4.7	+7.2	+6.3	+3.4	+1.4	+0.1	-0.2	-2.2	+1.0	+2.4	+2.5	+2.8	+3.2	+3.5	+3.3	+4.1	+2.7
17th	+5.0	+3.0	+3.8	+4.0	+3.5	+4.9	—	+5.2	+5.2	+7.1	+6.4	+2.7	-1.0	-0.5	+1.2	+1.5	+1.1	+0.8	+1.2	+1.4	+0.7	+3.4	+4.2	+4.2
18th	+4.2	+4.3	+3.3	+4.8	+5.3	+5.2	+4.5	+5.1	+7.3	+8.5	+7.5	+6.3	+3.0	+1.5	+0.2	+1.4	+1.2	+2.2	+3.3	+4.2	+3.6	+5.5	+4.0	+4.3
19th	+3.5	+3.3	+3.4	+3.7	+4.3	+4.6	+4.8	+5.1	+5.2	+5.2	+4.3	+2.2	-0.1	-1.1	-0.3	+0.2	+2.4	+2.0	+3.8	+4.1	+3.1	+3.3	+2.9	+4.4
20th	+3.6	+3.7	+4.4	+4.4	+4.6	+5.1	+5.1	+6.0	+5.9	+6.5	+3.4	+1.0	-1.2	-3.0	-0.8	-0.1	+1.3	+2.6	+3.7	+3.9	+4.2	+4.6	+4.1	+4.1
21st	+3.7	+3.3	+3.8	+3.4	+3.4	+2.4	+6.8	+5.7	+4.9	+3.7	+2.8	+1.2	+1.0	+0.8	+2.5	+3.9	+5.3	+4.7	+13.1	+5.6	+5.2	+5.0	+5.1	+5.2
22d	+5.8	+4.6	+4.8	+4.8	+5.1	+4.7	+5.9	+6.7	+7.0	+7.0	+5.9	+4.1	+1.4	+0.4	+1.1	+3.2	+5.8	+7.0	+6.4	+4.8	+2.4	+0.2	+3.4	+2.6
23d	+2.5	+2.9	+2.5	+3.7	+3.7	+4.8	+7.7	+9.8	+7.2	+5.8	+4.9	+3.1	+1.8	+1.9	+7.5	+3.0	+1.1	+2.4	+1.5	+0.9	-0.4	+1.5	+2.2	+2.5
24th	+1.6	+3.6	+3.4	+6.1	+9.4	+4.2	+7.6	+4.2	+0.4	+2.8	+3.6	+1.1	-1.9	-0.5	+2.4	-1.0	-5.1	-8.3	-4.4	-1.4	-5.3	-0.9	-0.9	+3.2
25th	+2.7	+2.0	+3.6	+2.7	+3.7	+4.8	+4.3	+5.6	+1.1	-1.3	-5.4	-7.2	-7.9	-3.0	-3.0	-5.1	-3.0	-2.3	+1.5	+1.9	+2.7	+0.8	+1.9	+2.2
26th	+1.4	+1.6	+0.9	+0.7	+1.6	+7.6	+5.6	+2.4	-0.4	-0.1	-2.7	-4.1	-5.9	-3.1	+0.6	+0.5	-2.0	+0.8	+2.3	+1.4	+0.7	+2.6	+2.4	+2.3
27th	+3.4	+2.5	+2.1	+1.8	+2.8	+4.1	+3.9	+2.8	+2.6	+1.5	+0.9	-1.1	-1.7	-1.5	-2.7	-1.0	+0.7	+0.2	-1.0	-0.5	+2.1	+3.8	+1.5	+1.5
28th	+1.5	+1.8	+3.7	+1.8	+2.5	+3.3	+3.1	+1.8	+3.8	+2.1	-1.5	-3.6	-8.1	-4.6	-1.6	+0.9	-1.9	-0.1	+0.7	+0.1	+3.8	+0.4	+1.6	+2.5
29th	+4.4	+2.3	+3.2	+3.9	+4.1	+5.0	+5.1	+3.5	+2.3	+3.8	-2.6	-7.2	-6.6	-3.1	+0.9	+2.0	+3.2	+4.7	-0.2	-3.5	-2.1	-2.5	+0.4	+0.6
30th	+5.8	+3.8	+2.5	+2.3	+2.3	+3.1	+4.6	+5.4	+4.4	+2.2	+0.2	-2.5	-6.6	-4.9	-2.7	+0.5	+2.5	-0.2	+1.3	+3.1	+3.6	+3.4	+6.4	+3.8
31st	+3.1	+2.7	+2.3	+2.6	+3.0	+4.6	+2.7	+4.7	+3.3	+1.9	-0.5	-4.3	-5.8	-2.9	-0.6	-0.1	+0.3	+1.6	+2.1	+2.7	+2.2	+3.2	+2.4	+1.4
Means	+3.88	+3.57	+6.49	+4.33	+4.36	+4.86	+5.16	+3.57	+4.52	+3.52	+2.47	+1.20	-0.17	+0.03	+0.48	+0.43	+0.58	+0.18	0.00	-0.33	-0.04	+1.25	+1.90	+2.44
Normals	+3.00	+2.57	+2.97	+3.16	+3.81	+4.60	+4.40	+4.28	+4.03	+3.82	+1.67	+0.26	-2.05	-1.59	-0.49	-0.14	+1.03	+0.86	+2.22	+1.60	+1.31	+1.97	+2.77	+3.33

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF AUGUST 1862.

Value of a part of division = 0.0001,16.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.2	+ 2.0	+ 2.2	+ 2.3	+ 3.4	+ 4.2	+ 5.1	+ 6.0	+ 6.4	+ 5.5	+ 2.6	+ 0.7	- 0.1	- 1.5	- 3.1	- 1.5	+ 1.2	+ 2.1	+ 2.8	+ 3.0	+ 4.5	+ 4.6	+ 4.8	+ 5.0
2d	+ 4.6	+ 4.2	+ 4.8	+ 4.1	+ 4.1	+ 3.3	+ 5.7	+ 4.5	+ 5.2	+ 3.4	+ 0.4	+ 0.3	+ 0.7	+ 1.9	+ 2.4	+ 1.2	+ 2.8	+ 5.0	+ 3.1	+ 3.0	+ 4.0	+ 3.7	+ 4.4	+ 4.4
3d	+ 3.4	+ 5.9	+ 2.0	+ 2.2	+ 2.5	+ 3.7	—	+ 4.0	+ 3.9	+ 3.9	+ 3.0	+ 0.4	- 0.6	+ 0.8	+ 2.4	+ 3.4	+ 3.1	+ 4.4	+ 5.2	+ 4.6	+ 4.5	+ 2.4	+ 2.7	+ 2.9
4th	+ 4.2	+ 3.2	+ 2.6	+ 2.3	+ 3.4	+ 3.9	+ 4.7	+ 5.3	+ 5.6	+ 5.9	+ 3.9	0.0	+ 1.0	+ 1.5	+ 3.9	+ 3.2	- 2.5	- 16.9	- 8.8	- 2.0	- 16.2	- 10.1	- 16.0	- 7.1
5th	- 9.1	- 3.3	- 8.2	- 7.7	- 5.3	- 5.5	- 5.3	- 9.4	- 6.7	+ 0.1	- 18.7	- 36.0	- 26.1	- 32.6	- 27.2	- 18.1	- 19.3	- 13.1	- 22.4	- 24.3	- 9.8	- 18.9	- 15.0	- 10.1
6th	+ 0.8	- 13.3	- 12.4	- 10.7	- 6.9	- 7.6	- 7.4	- 9.1	- 8.1	- 7.5	- 8.2	- 10.5	- 11.2	- 9.7	- 11.5	- 8.3	- 7.4	- 6.7	- 5.3	- 3.1	- 1.6	+ 0.9	- 7.4	- 4.1
7th	- 4.1	- 3.6	- 1.6	- 2.2	—	- 1.6	—	+ 1.4	+ 4.6	+ 3.4	+ 2.8	- 1.5	- 0.7	0.0	- 4.5	- 4.3	- 3.7	- 3.3	- 0.1	+ 1.6	+ 4.4	+ 2.1	+ 4.9	- 5.0
8th	+ 4.0	+ 10.3	+ 5.6	+ 4.3	+ 4.4	+ 4.4	+ 4.1	+ 4.1	+ 4.0	+ 3.7	- 1.4	- 1.4	- 10.0	- 7.4	- 3.3	- 0.8	+ 0.8	+ 1.7	+ 3.7	+ 0.6	+ 0.5	+ 3.6	+ 3.4	+ 4.4
9th	+ 6.5	+ 8.3	+ 5.0	+ 5.6	+ 5.1	+ 6.3	+ 7.0	+ 7.2	+ 8.2	+ 7.3	- 2.4	- 6.7	- 1.0	+ 0.2	- 4.9	+ 3.2	- 0.8	+ 0.8	+ 4.3	+ 2.9	+ 2.0	+ 3.0	+ 5.3	+ 5.3
10th	+ 2.7	+ 3.2	+ 3.6	+ 8.7	+ 4.0	+ 5.0	+ 7.7	+ 6.1	+ 5.6	+ 4.7	- 1.9	+ 1.7	- 1.4	- 1.8	- 5.7	- 4.4	- 2.3	+ 3.6	+ 2.4	+ 2.0	+ 0.8	+ 3.0	+ 2.8	+ 3.7
11th	+ 3.4	+ 3.5	+ 3.8	+ 3.0	+ 2.4	+ 2.4	+ 2.2	+ 4.6	+ 4.7	+ 4.7	+ 3.4	+ 2.0	- 1.4	- 0.4	+ 1.2	+ 0.9	+ 2.7	+ 4.8	+ 5.4	+ 6.6	+ 5.0	+ 6.7	+ 7.0	+ 6.7
12th	+ 6.7	+ 5.6	+ 6.2	+ 6.3	+ 6.8	+ 6.6	+ 6.8	+ 7.2	+ 7.5	+ 7.2	+ 6.0	+ 4.2	+ 2.3	+ 1.5	+ 1.7	+ 1.7	+ 3.5	+ 3.0	+ 4.9	+ 4.5	+ 5.3	+ 5.0	+ 5.2	+ 5.2
13th	+ 5.9	+ 8.5	+ 5.9	+ 5.5	+ 6.7	+ 6.9	+ 7.0	+ 8.8	+ 9.4	+ 10.3	+ 8.1	+ 5.1	+ 3.0	+ 2.5	+ 1.3	+ 2.0	+ 2.3	+ 1.2	- 0.3	+ 1.5	+ 2.1	+ 2.8	+ 4.6	+ 4.5
14th	+ 5.7	+ 6.5	+ 0.9	+ 7.6	+ 9.0	+ 9.3	+ 9.7	+ 5.2	+ 2.3	+ 1.8	- 2.3	- 5.0	- 5.9	- 9.0	- 7.0	- 5.3	- 2.5	- 1.8	- 1.0	+ 0.7	+ 2.1	+ 3.7	+ 4.5	+ 3.8
15th	+ 10.6	+ 1.3	+ 7.7	+ 4.6	+ 6.5	+ 10.9	+ 8.1	+ 6.5	+ 7.5	+ 5.8	+ 3.5	+ 1.9	+ 2.4	+ 1.0	+ 2.0	+ 2.9	+ 5.5	+ 5.7	+ 5.0	+ 4.9	+ 5.4	+ 4.7	+ 5.5	+ 6.3
16th	+ 5.6	+ 6.0	+ 6.3	+ 7.1	+ 7.4	+ 8.2	+ 8.4	+ 9.3	—	+ 8.5	+ 6.3	+ 3.6	0.0	+ 0.2	+ 2.4	+ 5.9	+ 6.2	+ 6.1	+ 5.8	+ 6.0	+ 6.4	+ 6.1	+ 6.6	+ 7.0
17th	+ 6.7	+ 6.2	+ 7.3	+ 9.0	+ 7.3	+ 7.8	+ 7.8	+ 8.7	+ 9.1	+ 9.6	+ 7.9	+ 5.6	+ 3.9	+ 2.8	+ 2.4	+ 3.1	+ 4.2	+ 5.6	+ 7.4	+ 6.6	+ 5.8	+ 5.6	+ 5.6	+ 7.1
18th	+ 8.0	+ 7.5	+ 8.1	+ 7.7	+ 8.7	+ 8.2	+ 8.4	+ 8.7	+ 8.8	+ 8.8	+ 8.1	+ 5.7	+ 2.3	+ 0.3	+ 1.7	+ 3.3	+ 5.8	+ 7.3	+ 6.2	+ 8.5	+ 7.5	+ 7.7	+ 7.8	+ 7.9
19th	+ 8.5	+ 8.3	+ 8.1	+ 8.3	+ 10.0	+ 10.3	+ 10.1	+ 10.5	+ 10.7	+ 10.4	+ 11.4	+ 5.5	+ 2.6	- 2.0	+ 4.1	+ 4.8	+ 5.6	+ 5.8	+ 8.8	+ 8.5	+ 6.5	+ 6.5	+ 6.6	+ 6.1
20th	+ 5.8	+ 6.7	+ 5.5	+ 6.6	+ 8.1	+ 8.4	+ 9.2	+ 10.6	+ 9.6	+ 5.5	+ 7.1	+ 2.5	- 1.7	- 2.5	- 5.9	- 14.2	- 11.1	- 1.8	+ 0.8	- 3.2	- 5.7	- 3.3	- 1.5	+ 0.7
21st	- 0.2	+ 1.4	+ 0.4	+ 0.5	+ 1.4	+ 1.9	+ 2.2	+ 2.9	+ 2.7	+ 1.7	- 0.6	- 2.3	- 5.2	- 5.8	- 3.0	- 3.0	- 0.4	+ 0.8	+ 2.2	+ 1.8	+ 1.9	+ 1.7	+ 2.3	+ 1.8
22d	+ 1.9	+ 2.3	+ 2.7	+ 2.9	+ 3.5	+ 4.8	+ 4.3	+ 6.1	+ 5.7	+ 4.4	+ 1.3	+ 0.2	- 1.7	- 1.1	+ 0.3	+ 0.2	- 1.2	+ 1.1	+ 2.1	+ 2.6	+ 3.0	+ 3.2	+ 3.7	+ 3.0
23d	+ 3.5	+ 3.7	+ 4.6	+ 4.6	+ 4.2	+ 4.5	+ 5.9	+ 6.0	+ 6.8	+ 8.8	+ 7.0	+ 5.3	+ 2.6	+ 1.4	+ 0.4	+ 2.6	+ 4.1	+ 4.6	+ 4.4	+ 5.5	+ 5.1	+ 4.6	+ 4.4	+ 4.1
24th	+ 5.1	+ 5.0	+ 6.8	+ 10.3	+ 8.4	+ 6.7	+ 8.2	+ 6.5	+ 7.8	+ 7.5	+ 5.4	+ 1.4	- 3.2	- 1.1	- 0.1	+ 1.0	+ 2.6	+ 3.0	+ 4.5	+ 1.2	+ 4.4	+ 0.4	- 3.7	- 1.7
25th	- 0.3	- 0.4	+ 1.8	+ 4.2	- 0.3	+ 0.1	+ 2.0	+ 3.8	+ 4.4	+ 4.1	+ 2.8	+ 1.5	+ 2.2	- 3.0	- 0.8	+ 0.1	- 1.5	- 1.6	- 0.2	+ 5.9	+ 2.3	+ 0.1	+ 1.7	+ 2.8
26th	+ 2.6	+ 1.9	+ 3.3	+ 4.4	+ 3.1	+ 3.2	+ 2.1	+ 6.4	+ 5.3	+ 4.2	+ 0.8	- 0.2	- 1.4	- 0.7	- 2.8	- 5.6	- 3.1	+ 1.2	- 0.2	+ 0.7	+ 1.6	+ 0.7	+ 3.6	+ 10.0
27th	+ 5.8	+ 3.8	+ 4.0	+ 4.7	+ 5.3	+ 5.5	+ 7.2	+ 8.4	+ 7.8	+ 5.9	+ 1.5	- 2.0	- 3.0	- 2.1	- 0.1	- 0.1	+ 3.1	+ 3.8	+ 2.1	+ 2.1	+ 2.1	+ 3.9	+ 4.5	+ 5.0
28th	+ 4.9	+ 5.3	+ 6.0	+ 6.5	+ 7.7	+ 9.0	+ 9.0	+ 10.3	+ 10.7	+ 9.3	+ 8.1	+ 7.2	+ 6.3	+ 4.5	+ 5.8	+ 6.3	+ 8.6	+ 9.5	+ 5.3	+ 2.2	- 1.2	+ 5.0	+ 7.3	+ 7.5
29th	+ 6.3	+ 6.0	+ 5.5	+ 4.8	+ 2.9	+ 4.9	+ 5.0	+ 9.0	+ 9.9	+ 7.6	+ 3.4	+ 1.9	- 5.0	- 7.0	- 8.2	+ 0.2	- 2.5	- 2.3	- 7.5	- 0.8	- 6.0	- 2.6	+ 2.9	+ 2.6
30th	+ 3.6	+ 1.9	+ 2.7	+ 2.2	+ 3.4	+ 3.5	+ 6.1	+ 7.3	+ 7.5	+ 6.2	+ 2.1	- 1.2	- 0.2	+ 2.2	+ 2.8	+ 1.9	+ 3.3	+ 4.3	+ 3.4	+ 1.7	+ 1.5	+ 2.7	+ 2.7	+ 13.5
31st	+ 1.9	+ 4.3	+ 6.3	+ 10.4	+ 8.9	+ 5.9	+ 4.9	+ 7.2	+ 6.0	+ 6.1	+ 5.2	- 3.0	- 4.9	- 2.0	- 3.6	- 7.0	- 6.0	- 7.2	- 7.4	- 2.6	- 0.7	- 1.9	+ 7.9	+ 0.7
Means	+ 3.73	+ 3.62	+ 3.47	+ 4.20	+ 4.54	+ 4.68	+ 5.39	+ 5.62	+ 5.76	+ 5.45	+ 2.47	- 0.42	- 1.79	- 2.22	- 1.84	- 0.80	+ 0.04	+ 0.99	+ 1.18	+ 1.72	+ 1.53	+ 1.86	+ 2.55	+ 3.35
Normals	+ 4.16	+ 4.18	+ 4.42	+ 5.12	+ 4.93	+ 5.46	+ 6.26	+ 6.64	+ 6.70	+ 5.88	+ 3.57	+ 1.15	- 0.98	- 1.21	- 0.63	+ 0.26	+ 1.09	+ 2.09	+ 2.34	+ 2.58	+ 2.53	+ 2.99	+ 4.20	+ 4.18

FLAGSTAFF OBSERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF SEPTEMBER 1862.

Value of a part of division = 0.0001,80.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 2.1	+ 2.7	+ 4.7	+ 6.0	+ 4.2	+ 4.3	+ 4.5	+ 6.3	+ 2.1	+ 2.2	+ 0.4	- 1.3	- 4.2	- 9.5	- 6.5	- 6.1	- 3.7	+ 0.4	- 1.6	+ 0.2	+ 0.4	+ 1.2	+ 0.7	+ 1.4
2d	+ 1.8	+ 3.6	+ 4.2	+ 2.2	+ 1.8	+ 1.2	+ 2.6	+ 5.8	+ 2.6	+ 1.6	- 1.4	- 2.5	- 7.8	- 8.2	- 9.7	- 4.2	- 0.2	+ 1.7	+ 1.1	+ 0.4	- 1.7	- 4.7	+ 0.6	+ 0.2
3d	- 0.3	- 0.7	- 1.0	- 0.1	- 0.1	0.0	+ 3.3	+ 3.0	+ 2.0	+ 3.0	+ 0.7	-	- 3.2	- 4.4	- 3.6	- 4.4	- 2.0	- 2.5	+ 1.3	+ 2.7	- 0.1	+ 0.1	+ 2.8	+ 3.4
4th	+ 1.7	+ 4.1	+ 2.7	+ 6.2	+ 5.5	+ 4.0	+ 6.6	+ 6.8	+ 5.8	+ 3.8	+ 0.1	- 1.8	- 5.8	- 6.7	+ 0.1	- 1.4	0.0	- 1.3	+ 3.1	- 3.5	- 2.0	+ 1.4	- 1.4	+ 0.7
5th	+ 1.6	+ 1.1	+ 2.7	+ 2.7	+ 2.3	+ 2.7	+ 4.7	- 0.8	+ 3.1	+ 2.2	- 4.5	- 4.9	- 8.0	- 5.5	- 2.4	- 1.7	- 1.3	+ 0.2	+ 0.9	- 2.9	- 2.6	+ 4.4	+ 1.3	+ 1.5
6th	+ 4.9	+ 4.6	+ 2.9	+ 4.7	+ 9.5	+ 4.7	+ 5.0	+ 6.9	+ 5.2	+ 2.9	+ 1.3	0.0	- 3.6	- 4.1	- 3.0	- 0.6	0.0	+ 3.2	+ 2.6	+ 5.3	+ 4.1	+ 5.1	+ 6.1	+ 6.3
7th	+ 6.7	+ 6.6	+ 7.3	+ 9.0	+ 8.3	+ 9.5	+ 8.7	+ 8.5	+ 7.7	+ 5.0	+ 4.1	+ 3.3	+ 3.2	+ 2.2	+ 3.0	- 1.2	+ 3.1	+ 2.4	+ 1.2	+ 3.8	- 0.5	- 1.9	+ 1.3	+ 3.1
8th	+ 0.3	+ 3.9	+ 2.9	+ 3.3	+ 4.3	+ 5.1	+ 5.2	+ 5.8	+ 4.5	+ 0.2	+ 2.4	+ 0.7	- 1.8	- 1.2	- 0.3	+ 1.8	+ 2.2	+ 4.2	+ 5.8	+ 5.4	+ 5.8	+ 6.8	+ 7.3	+ 7.1
9th	+ 8.0	+ 8.3	+ 8.6	+ 9.2	+ 9.2	+ 10.2	+ 12.1	+ 10.4	+ 9.3	+ 8.5	+ 5.9	+ 3.8	- 0.7	+ 2.5	+ 9.9	+ 6.4	+ 6.0	+ 10.4	- 8.1	- 1.1	+ 13.1	+ 1.1	- 12.3	- 9.6
10th	- 1.0	- 2.0	- 4.0	+ 6.8	- 1.0	- 2.3	- 1.0	- 6.6	- 0.4	- 1.0	- 3.8	+ 0.8	- 4.3	- 7.4	- 5.7	- 2.0	- 0.5	0.0	- 1.6	- 2.1	- 1.0	+ 4.0	- 3.2	- 4.3
11th	- 1.1	+ 1.4	+ 2.3	+ 1.8	+ 3.2	+ 6.5	+ 7.2	+ 8.1	+ 7.8	+ 6.3	+ 4.9	+ 3.4	+ 2.0	+ 2.6	+ 2.6	+ 3.3	+ 3.4	+ 4.4	+ 5.9	+ 4.0	+ 8.8	+ 7.0	+ 5.4	+ 7.1
12th	+ 5.1	+ 5.3	+ 5.1	+ 5.9	+ 7.4	+ 7.1	+ 8.6	+ 8.7	+ 8.9	+ 6.8	+ 5.1	+ 3.3	+ 2.8	+ 1.9	+ 2.8	+ 3.2	+ 3.7	+ 4.0	+ 4.4	+ 5.2	+ 4.7	+ 5.1	+ 5.5	+ 4.4
13th	+ 3.9	+ 3.5	+ 4.1	+ 4.7	+ 4.9	+ 5.4	+ 6.4	+ 6.7	+ 5.8	+ 4.2	+ 2.7	+ 8.0	+ 2.0	+ 2.5	+ 4.5	+ 6.9	+ 6.9	+ 6.1	+ 5.9	+ 5.9	+ 5.4	+ 5.4	+ 4.8	+ 4.7
14th	+ 4.4	+ 5.5	+ 5.9	+ 6.6	+ 7.2	+ 9.4	+ 8.4	+ 8.4	+ 7.9	+ 6.9	+ 4.1	+ 2.1	+ 2.3	+ 3.3	+ 3.2	+ 3.2	+ 6.0	+ 6.3	+ 6.1	+ 6.9	+ 7.2	+ 7.8	+ 7.7	+ 7.7
15th	+ 7.6	+ 8.2	+ 8.8	+ 9.0	+ 9.5	+ 10.1	+ 10.7	+ 10.2	+ 9.1	+ 7.7	+ 6.2	+ 4.0	+ 2.7	+ 1.8	+ 0.7	+ 4.0	+ 8.2	+ 7.3	+ 6.6	+ 4.0	+ 3.3	+ 3.2	+ 5.8	+ 6.5
16th	+ 7.6	+ 7.5	+ 7.7	+ 7.8	+ 8.3	+ 10.2	+ 9.7	+ 9.1	+ 6.8	+ 5.3	+ 1.6	+ 2.4	+ 3.6	+ 4.9	+ 6.4	+ 9.4	+ 9.1	+ 6.6	+ 7.0	+ 6.2	+ 6.9	+ 5.7	+ 5.8	+ 6.2
17th	+ 6.4	+ 6.2	+ 6.9	+ 7.7	+ 8.5	+ 8.3	+ 8.9	+ 9.8	+ 9.1	+ 8.4	+ 7.5	+ 6.2	+ 5.6	+ 2.6	+ 5.1	- 0.3	+ 2.3	- 0.4	+ 2.7	+ 0.2	+ 7.3	+ 2.0	+ 1.7	- 0.1
18th	- 1.2	+ 3.0	+ 2.2	+ 2.4	+ 3.3	+ 3.6	+ 3.3	+ 4.1	+ 5.2	+ 2.6	+ 2.3	+ 1.7	- 0.8	0.0	+ 1.3	+ 2.2	+ 2.8	+ 3.3	+ 2.9	+ 0.5	+ 5.9	+ 3.5	+ 3.5	+ 4.0
19th	+ 7.3	+ 6.4	+ 5.7	+ 3.6	+ 5.9	+ 8.0	+ 8.8	+ 8.9	+ 7.2	+ 4.3	+ 0.4	- 1.9	- 1.2	- 1.1	- 0.5	+ 3.2	+ 2.6	+ 4.8	+ 4.6	+ 4.2	+ 4.3	+ 3.6	+ 4.5	+ 4.0
20th	+ 4.9	+ 6.7	+ 4.7	+ 5.1	+ 5.0	+ 7.4	+ 6.5	+ 6.3	+ 6.5	+ 4.7	+ 0.7	- 4.6	- 3.0	- 1.6	- 0.1	+ 2.0	+ 2.6	+ 3.8	-	-	-	-	-	-
21st	-	-	-	-	-	-	-	+ 4.4	0.0	+ 1.8	+ 1.2	+ 1.2	+ 10.4	- 0.6	+ 1.9	+ 2.9	+ 5.3	+ 3.3	-	-	-	-	-	-
22d	+ 9.2	+ 13.0	+ 10.0	+ 8.1	+ 8.6	+ 9.9	+ 9.0	+ 8.0	+ 8.1	+ 4.5	+ 4.2	+ 3.0	+ 2.8	+ 2.6	+ 5.3	+ 5.8	+ 3.1	+ 5.0	+ 4.4	+ 6.4	+ 6.4	+ 6.3	+ 8.2	+ 7.6
23d	+ 7.5	+ 7.8	+ 8.8	+ 10.3	+ 8.4	+ 7.8	+ 8.6	+ 7.9	+ 6.2	+ 3.4	+ 1.9	+ 0.9	+ 0.9	+ 2.5	+ 4.7	+ 5.2	+ 5.9	+ 4.8	+ 6.2	-	+ 3.9	+ 2.8	+ 5.2	+ 6.1
24th	+ 12.9	+ 10.3	+ 8.9	+ 6.3	+ 6.7	+ 6.0	+ 6.9	+ 6.8	+ 5.2	+ 4.1	+ 1.5	+ 0.4	+ 0.4	+ 2.0	+ 3.3	+ 3.2	+ 2.5	+ 3.0	+ 5.9	+ 6.8	+ 8.3	+ 7.4	+ 7.8	+ 14.5
25th	+ 8.1	+ 29.8	- 1.6	- 6.6	+ 1.4	- 6.1	- 4.8	- 5.0	- 4.8	- 5.0	- 7.9	- 7.0	- 4.3	- 2.2	- 0.5	- 1.4	0.0	- 5.1	- 2.7	- 2.4	+ 1.3	+ 3.2	+ 2.0	+ 1.7
26th	+ 7.6	+ 2.0	+ 2.4	+ 1.2	+ 5.2	+ 5.2	+ 4.4	+ 4.2	+ 1.2	-	- 4.1	- 10.0	- 7.4	- 3.4	- 3.8	- 5.8	- 9.7	+ 0.3	+ 8.2	- 1.5	- 2.1	- 1.6	+ 2.9	- 0.8
27th	0.0	+ 1.7	+ 5.5	+ 4.1	+ 2.6	+ 5.2	+ 2.6	+ 1.8	- 2.4	- 0.8	- 6.0	- 4.5	- 5.8	- 3.6	+ 0.1	+ 2.0	+ 2.9	+ 1.8	+ 1.7	- 1.7	- 0.4	+ 8.8	+ 2.2	+ 5.0
28th	+ 8.5	+ 2.4	+ 4.2	+ 4.8	+ 5.3	+ 6.7	+ 7.3	+ 4.1	- 0.8	- 2.5	- 1.9	- 5.4	- 8.8	- 9.2	- 8.5	- 5.9	- 4.0	- 2.7	- 2.1	- 2.6	- 4.0	- 4.2	- 2.3	- 1.4
29th	0.4	+ 0.4	+ 0.1	- 0.7	- 0.4	- 0.3	+ 0.9	+ 0.5	+ 0.1	- 2.9	- 4.7	- 6.8	- 6.5	- 4.6	- 3.2	- 1.3	- 0.1	- 0.7	- 0.2	+ 0.8	+ 1.3	+ 3.9	+ 2.1	+ 2.3
30th	+ 3.1	+ 2.3	+ 3.0	+ 2.2	+ 7.3	+ 22.7	+ 2.0	+ 1.9	+ 1.7	- 0.8	- 0.6	- 1.3	- 2.5	- 1.1	+ 1.5	+ 2.3	+ 2.4	+ 2.8	+ 3.3	+ 3.0	+ 3.1	+ 3.7	+ 3.1	+ 4.1
Means	+ 4.39	+ 5.37	+ 4.33	+ 4.63	+ 5.25	+ 5.95	+ 5.76	+ 5.37	+ 4.36	+ 3.01	+ 0.81	- 0.23	- 1.37	- 1.43	+ 0.29	+ 1.02	+ 1.93	+ 2.58	+ 2.70	+ 2.00	+ 3.11	+ 3.25	+ 2.82	+ 3.34
Normals	+ 4.39	+ 4.42	+ 4.63	+ 5.03	+ 5.25	+ 6.08	+ 6.40	+ 6.42	+ 4.93	+ 3.30	+ 1.14	+ 0.36	- 1.79	- 0.33	+ 0.90	+ 1.50	+ 2.15	+ 2.58	+ 3.10	+ 2.00	+ 3.00	+ 3.85	+ 3.39	+ 3.71

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF OCTOBER 1862.

Value of a part of division = 0.0001,80.

DAY of th e MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 3.8	+ 2.6	- 0.7	+ 2.8	+ 3.7	+ 3.9	+ 3.8	+ 4.7	+ 4.6	+ 1.5	- 2.6	- 4.9	- 3.5	- 0.7	- 1.6	- 0.2	- 2.0	+ 0.3	+ 2.8	+ 1.3	+ 0.5	+ 2.8	+ 3.4	+ 3.9
2d	+ 4.2	+ 3.6	- 7.1	+ 13.9	+ 6.2	+ 4.1	+ 4.9	- 14.5	+ 3.9	+ 2.0	+ 0.4	- 5.4	- 4.2	- 1.5	- 0.8	0.0	+ 1.2	+ 2.7	+ 3.6	+ 2.0	+ 2.8	+ 2.4	+ 3.2	+ 2.7
3d	+ 5.3	+ 3.5	+ 4.1	+ 6.7	+ 4.9	+ 5.1	+ 5.1	+ 5.2	+ 5.6	+ 2.1	- 1.0	- 3.7	- 4.4	- 3.0	- 5.2	- 3.3	- 1.9	- 0.8	- 0.6	- 4.2	- 0.6	+ 1.9	+ 2.6	+ 2.4
4th	+ 2.0	+ 4.0	+ 4.9	+ 5.5	+ 6.7	+ 13.6	+ 15.5	- 13.5	- 11.2	- 3.9	- 6.1	- 9.4	-	- 10.1	- 21.4	- 23.6	- 25.9	- 25.0	- 29.2	- 27.5	- 17.7	- 24.7	- 13.1	- 8.6
5th	- 11.6	- 13.2	+ 0.8	- 5.5	- 7.5	- 17.8	- 9.7	- 8.0	- 10.4	- 13.1	- 15.7	- 12.3	- 11.6	- 1.5	- 7.6	- 8.6	- 5.6	- 6.5	- 10.0	- 0.8	- 1.6	+ 2.5	+ 1.8	+ 7.3
6th	+ 3.7	+ 1.2	+ 2.6	+ 4.9	+ 0.8	- 8.1	+ 7.4	+ 7.5	+ 4.5	+ 2.1	+ 1.5	- 2.8	- 3.4	- 6.9	- 3.5	- 4.8	- 5.9	- 6.8	- 5.4	- 5.4	- 15.9	- 10.3	+ 0.1	+ 10.0
7th	- 14.1	- 6.1	- 8.7	+ 2.7	+ 13.7	- 0.4	- 2.1	- 4.5	- 0.5	- 3.6	- 4.1	- 4.5	- 3.6	- 2.8	- 5.9	- 4.9	- 3.6	- 2.3	- 1.2	- 1.2	- 1.2	- 0.8	+ 0.8	+ 0.1
8th	+ 0.5	+ 1.2	+ 1.8	+ 2.1	+ 2.8	+ 3.3	+ 3.5	+ 2.7	+ 0.4	- 1.4	- 13.2	- 5.1	- 4.1	- 2.7	- 1.5	- 0.4	+ 0.5	+ 0.9	+ 2.2	+ 3.2	+ 4.6	+ 4.1	+ 3.8	+ 4.1
9th	+ 8.8	+ 10.9	+ 5.5	+ 2.6	+ 4.8	+ 4.4	+ 4.2	+ 3.7	+ 1.3	- 3.2	- 4.5	- 4.4	- 5.8	- 4.7	-	- 1.1	- 0.8	+ 2.1	+ 4.1	+ 0.9	+ 1.2	+ 0.8	- 2.3	- 1.1
10th	- 2.1	- 4.2	- 2.7	- 1.0	+ 0.9	- 2.6	+ 0.6	+ 2.9	+ 4.4	- 0.6	- 3.1	- 6.0	- 6.4	- 6.6	- 5.0	- 2.2	- 0.6	+ 0.6	+ 2.3	+ 3.2	- 0.3	+ 1.4	+ 4.2	+ 2.8
11th	+ 4.8	+ 5.1	+ 5.2	+ 5.7	+ 8.8	+ 9.9	+ 10.1	+ 10.6	+ 7.6	+ 5.9	+ 1.9	+ 0.2	+ 1.9	+ 2.0	+ 4.9	+ 2.7	- 21.8	- 13.8	- 10.0	- 7.3	- 7.2	- 3.3	- 2.4	- 2.6
12th	+ 6.5	- 0.3	- 0.5	+ 3.3	+ 1.2	+ 5.4	+ 4.4	+ 3.1	+ 0.3	- 3.5	- 5.5	- 7.5	- 4.4	- 4.2	- 3.6	- 7.8	- 8.5	- 6.1	- 3.3	+ 1.6	+ 3.4	0.0	+ 3.8	+ 4.0
13th	+ 1.7	+ 7.0	+ 4.0	+ 6.9	+ 3.5	- 0.1	+ 2.4	+ 2.5	+ 1.2	- 3.7	- 7.9	- 8.6	- 7.2	- 5.6	- 3.7	- 1.7	- 1.9	- 5.2	- 5.1	-	+ 0.4	+ 4.2	+ 2.0	+ 2.9
14th	+ 5.9	+ 3.9	+ 3.6	+ 3.3	+ 4.2	+ 3.2	+ 5.4	+ 3.4	+ 2.1	- 0.2	- 5.3	- 6.3	- 15.1	- 9.6	- 3.2	- 4.4	- 9.3	- 4.0	- 3.5	-	-	-	-	-
15th	+ 10.3	+ 4.1	+ 8.1	0.0	+ 1.0	+ 1.3	+ 0.9	+ 4.1	- 1.1	+ 0.2	- 2.3	- 3.1	- 4.6	- 2.4	- 1.5	+ 1.6	+ 2.8	+ 3.4	+ 5.9	+ 4.7	+ 2.9	+ 8.5	+ 6.1	+ 6.8
16th	+ 7.6	+ 8.9	+ 7.9	+ 11.2	+ 7.7	+ 9.4	+ 9.1	+ 8.5	+ 4.8	+ 3.8	+ 1.8	+ 1.4	+ 2.0	+ 4.1	+ 2.3	+ 2.8	+ 4.8	+ 2.8	+ 2.4	+ 4.9	+ 5.9	+ 6.4	+ 6.6	+ 6.4
17th	+ 10.5	+ 8.0	+ 7.5	+ 5.4	+ 6.0	+ 7.0	+ 7.6	+ 5.5	+ 3.3	- 0.2	+ 2.3	+ 2.5	+ 2.4	+ 4.0	+ 5.5	+ 6.7	+ 6.9	+ 5.2	+ 5.7	+ 7.8	+ 7.6	+ 8.8	+ 8.9	+ 4.6
18th	+ 11.4	+ 7.7	+ 3.2	+ 10.3	+ 8.5	- 3.4	+ 9.2	+ 8.8	+ 9.0	+ 6.2	+ 2.3	- 1.3	- 1.5	- 1.6	- 0.6	+ 0.9	+ 2.8	+ 5.8	+ 11.0	+ 7.2	+ 7.0	+ 7.7	+ 7.1	+ 7.2
19th	+ 8.0	+ 9.3	+ 9.2	+ 9.6	+ 9.4	+ 10.0	+ 9.9	+ 9.5	+ 6.0	+ 3.2	+ 0.4	- 1.2	+ 0.6	+ 0.9	+ 2.2	+ 4.3	+ 5.0	+ 5.3	+ 5.2	+ 5.1	+ 6.9	+ 3.6	+ 5.7	+ 6.4
20th	+ 7.6	+ 7.4	+ 11.4	+ 9.5	+ 9.3	+ 10.1	+ 10.2	+ 9.2	+ 8.0	+ 4.7	+ 3.0	+ 2.4	+ 2.2	+ 2.3	+ 2.6	+ 2.7	+ 4.7	+ 5.7	+ 4.0	+ 5.2	+ 5.7	+ 5.6	+ 4.9	+ 6.0
21st	+ 4.8	+ 4.6	+ 5.1	+ 5.3	+ 6.0	+ 4.7	+ 7.6	+ 6.0	+ 4.3	-	- 2.6	- 4.7	- 4.4	- 3.9	- 2.7	- 0.4	+ 2.5	+ 2.6	+ 3.5	+ 5.0	+ 4.7	+ 5.6	+ 5.3	+ 7.3
22d	+ 7.3	+ 8.6	+ 8.6	+ 10.1	+ 11.0	+ 11.5	+ 10.5	+ 2.9	+ 4.8	+ 4.6	+ 1.9	- 1.6	- 2.7	0.0	+ 1.2	+ 1.0	- 1.3	+ 3.1	- 4.8	- 4.0	+ 2.1	- 13.2	- 9.8	+ 0.1
23d	- 6.7	- 7.8	- 8.5	- 5.5	+ 2.0	+ 1.4	- 0.1	- 3.9	- 9.7	- 12.0	- 11.1	- 8.3	-	- 4.0	- 3.0	- 4.1	+ 0.3	- 1.4	+ 2.3	+ 5.2	+ 0.8	+ 6.1	+ 4.3	+ 3.2
24th	+ 5.1	+ 4.6	+ 3.4	+ 4.2	+ 7.1	+ 6.6	+ 5.9	+ 1.3	- 1.1	- 3.1	- 7.9	- 8.5	- 3.1	- 0.3	+ 2.8	+ 2.2	+ 3.5	+ 5.4	+ 4.4	+ 6.1	+ 6.7	+ 7.7	+ 7.7	+ 6.6
25th	+ 13.5	+ 10.7	+ 6.8	+ 6.1	+ 6.5	+ 9.1	+ 9.6	+ 8.5	+ 5.0	+ 7.4	- 1.5	+ 4.8	- 4.4	- 1.0	+ 1.9	+ 0.9	+ 4.4	+ 5.1	+ 5.0	+ 5.6	+ 4.9	+ 11.3	+ 7.9	+ 5.7
26th	+ 6.1	+ 6.7	+ 8.9	+ 10.4	+ 8.9	+ 7.8	+ 8.1	+ 7.0	+ 1.9	- 4.3	- 5.9	- 5.5	- 4.1	0.0	+ 0.8	+ 1.1	- 0.3	- 1.3	+ 3.6	+ 4.9	+ 5.0	+ 5.2	+ 6.3	+ 6.7
27th	+ 4.1	+ 7.8	+ 5.6	+ 11.0	+ 8.6	+ 6.4	+ 6.5	+ 4.3	+ 2.4	+ 0.6	- 1.4	- 1.2	- 2.2	- 3.2	- 0.6	+ 1.6	+ 3.3	+ 4.2	+ 5.5	+ 5.2	+ 6.0	+ 5.8	+ 7.6	+ 7.9
28th	+ 8.0	+ 7.0	+ 8.3	+ 8.6	+ 10.1	+ 10.5	+ 8.8	-	-	-	-	-	-	+ 1.6	+ 3.0	+ 6.2	+ 6.1	+ 6.1	+ 5.9	+ 7.3	+ 4.6	+ 7.2	+ 3.6	+ 7.3
29th	+ 6.8	+ 7.4	+ 5.7	+ 5.3	+ 8.7	+ 7.9	+ 7.1	+ 5.2	+ 2.5	+ 0.7	- 1.5	- 1.5	- 1.8	+ 0.5	+ 0.5	+ 2.5	+ 3.2	+ 4.1	+ 2.9	+ 3.9	+ 4.8	+ 6.1	+ 7.6	+ 4.4
30th	+ 5.3	+ 6.5	+ 7.9	+ 8.2	+ 8.8	+ 10.1	+ 9.5	+ 8.1	+ 6.4	+ 3.6	+ 1.8	+ 0.5	+ 3.6	-	+ 7.3	+ 8.9	+ 7.6	+ 6.7	+ 6.1	+ 7.6	+ 6.3	- 0.2	+ 0.2	+ 10.0
31st	+ 7.4	+ 5.2	+ 8.3	+ 8.5	+ 10.3	+ 9.4	+ 6.6	+ 5.3	+ 4.8	+ 1.2	- 1.8	- 3.4	- 1.0	+ 0.8	+ 4.4	+ 3.7	+ 4.8	+ 6.7	+ 7.0	+ 6.3	+ 5.5	+ 6.9	+ 6.1	+ 6.0
Means	+ 4.40	+ 4.06	+ 3.88	+ 5.55	+ 5.95	+ 4.64	+ 5.89	+ 3.20	+ 2.17	- 0.10	- 2.92	- 3.65	- 3.24	- 2.00	- 10.7	- 0.57	- 0.81	+ 0.18	+ 0.72	+ 1.86	+ 1.86	+ 2.34	+ 3.13	+ 4.35
Normals	+ 5.84	+ 5.63	+ 5.22	+ 6.30	+ 6.15	+ 6.02	+ 6.39	+ 5.41	+ 3.36	+ 0.57	- 1.77	- 3.64	- 2.71	- 1.44	- 0.38	+ 0.02	+ 1.43	+ 3.04	+ 3.45	+ 4.26	+ 3.58	+ 4.41	+ 4.18	+ 5.06

FLAGSTAFF OBSERVATORY.

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MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF NOVEMBER 1862.

Value of a part of division = 0.0001,80.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 7.1	+ 7.9	+ 5.6	+ 7.6	+ 8.3	+ 8.9	+ 8.8	+ 8.0	+ 5.2	+ 2.4	+ 0.3	- 1.8	+ 0.4	+ 2.0	+ 2.7	+ 4.6	+ 6.5	+ 2.4	+ 5.3	+ 7.8	+ 9.6	+ 8.6	+ 7.2	+ 7.7
2d	+ 7.2	+ 15.2	+ 10.3	+ 7.6	+ 8.5	+ 8.0	+ 8.5	+ 8.0	+ 5.8	+ 0.8	- 0.5	+ 0.1	+ 1.7	+ 1.7	+ 5.0	+ 4.8	+ 5.2	+ 2.4	+ 0.1	+ 0.1	- 2.7	- 2.0	+ 2.8	+ 5.5
3d	+ 6.9	+ 12.0	+ 4.4	+ 5.7	+ 6.8	+ 7.3	+ 7.0	+ 7.0	+ 4.5	+ 2.5	- 1.6	- 2.0	- 1.9	+ 0.1	+ 1.7	+ 2.8	+ 4.8	+ 5.3	+ 5.8	+ 8.5	+ 8.3	+ 8.1	+ 6.6	+ 7.7
4th	+ 6.9	+ 5.8	+ 6.6	+ 7.2	+ 6.7	+ 8.6	+ 9.3	+ 8.3	+ 5.8	+ 0.1	- 0.4	- 2.3	- 3.1	- 0.4	- 2.5	- 1.4	- 1.9	- 5.9	+ 5.2	+ 4.4	+ 2.5	- 1.4	+ 7.8	- 0.1
5th	- 0.8	- 8.7	- 8.7	- 11.4	- 6.5	- 4.6	- 5.3	- 2.7	- 3.3	- 7.9	- 9.6	- 9.5	- 8.6	- 5.9	- 3.1	- 3.4	- 3.2	- 2.1	- 1.2	+ 0.8	+ 2.4	+ 1.7	+ 1.1	+ 4.4
6th	+ 2.5	+ 2.8	+ 3.6	+ 3.1	+ 9.3	+ 6.9	+ 7.4	+ 6.4	+ 4.8	+ 4.5	+ 3.2	+ 0.7	- 0.8	- 1.0	- 0.6	- 3.0	- 0.1	+ 1.2	- 1.1	- 1.8	- 3.0	+ 0.8	+ 2.4	+ 5.1
7th	+ 3.9	+ 4.0	+ 5.0	+ 5.5	+ 8.7	+ 5.6	+ 8.5	+ 6.7	+ 5.6	+ 5.0	+ 5.3	+ 5.4	+ 5.6	+ 4.6	+ 5.3	- 1.0	+ 3.7	+ 7.6	+ 7.4	+ 3.3	+ 1.2	+ 3.7	+ 6.8	+ 4.7
8th	- 0.3	+ 4.3	+ 9.3	+ 6.3	+ 6.7	+ 5.9	+ 6.9	+ 5.1	+ 4.3	+ 2.3	- 0.3	- 1.5	- 1.5	- 2.0	+ 4.1	+ 7.2	+ 6.6	+ 6.9	+ 7.1	+ 9.2	+ 6.6	+ 8.8	+ 9.0	+ 8.9
9th	+ 9.2	+ 12.4	+ 8.9	+ 9.3	+ 11.8	+ 12.2	+ 11.8	+ 9.4	+ 5.9	-	+ 1.9	+ 1.9	+ 1.8	+ 0.8	+ 3.9	+ 4.0	+ 5.4	+ 7.5	+ 14.9	+ 2.7	+ 5.3	+ 6.6	+ 7.1	+ 7.8
10th	+ 5.6	+ 8.1	+ 7.4	+ 7.1	+ 8.4	+ 9.8	+ 6.5	+ 2.7	+ 1.7	- 1.0	- 3.3	- 14.6	- 8.0	- 2.4	- 0.1	+ 3.3	+ 4.3	+ 5.6	- 0.1	+ 3.7	+ 5.6	+ 9.5	+ 14.0	+ 6.3
11th	+ 7.3	+ 10.0	+ 7.9	+ 7.8	+ 7.2	+ 6.9	+ 10.4	+ 10.4	+ 5.5	+ 0.6	- 0.5	+ 1.1	+ 1.0	+ 0.6	+ 3.0	+ 6.4	+ 4.8	+ 5.0	+ 5.6	+ 4.6	+ 6.3	+ 2.9	+ 6.5	+ 7.6
12th	+ 7.1	+ 7.1	+ 8.7	+ 9.4	+ 6.3	+ 7.7	+ 7.4	+ 6.9	+ 5.8	- 1.4	- 3.3	- 3.1	- 3.2	- 1.6	- 1.1	+ 1.9	+ 3.7	+ 3.7	+ 3.5	+ 2.9	+ 3.6	+ 5.3	+ 4.2	+ 8.3
13th	+ 6.9	+ 6.5	+ 6.9	+ 6.4	+ 7.5	+ 7.2	+ 8.0	+ 5.2	+ 4.0	+ 0.8	- 3.5	- 6.2	- 5.7	- 3.1	+ 1.7	+ 5.2	+ 5.3	+ 6.0	+ 4.1	+ 2.7	+ 3.4	+ 3.3	+ 3.5	+ 4.0
14th	+ 3.8	+ 3.1	+ 4.2	+ 4.2	+ 5.0	+ 6.6	+ 7.2	+ 7.3	+ 4.2	- 0.3	- 4.2	- 3.0	- 4.7	+ 0.8	+ 3.9	+ 6.0	+ 7.1	+ 7.2	+ 5.4	+ 5.4	+ 4.1	+ 5.1	+ 4.0	+ 6.1
15th	+ 6.2	+ 6.4	+ 6.4	+ 5.3	+ 6.0	+ 6.6	+ 7.7	+ 5.7	+ 4.1	+ 1.0	- 2.2	- 5.0	- 3.0	- 4.1	- 5.8	- 1.6	- 2.0	- 1.9	- 3.1	- 4.9	- 0.7	- 0.4	- 1.2	+ 0.7
16th	+ 3.3	+ 5.2	+ 9.3	+ 3.6	+ 3.4	+ 2.9	+ 2.6	+ 1.5	- 1.2	- 1.2	- 8.4	- 6.8	- 6.7	- 7.9	- 3.6	- 3.1	- 2.2	- 1.9	- 1.8	- 1.0	+ 1.2	+ 2.1	+ 2.2	+ 3.0
17th	+ 17.5	+ 16.8	+ 10.0	+ 4.9	+ 5.1	+ 6.2	+ 6.4	+ 7.4	+ 5.4	+ 1.3	- 4.5	- 4.2	- 5.5	- 2.7	- 0.2	- 2.4	0.0	+ 0.6	- 1.4	+ 2.9	+ 5.7	+ 3.8	+ 3.0	+ 3.6
18th	+ 3.3	+ 3.9	+ 4.5	+ 4.7	+ 3.9	+ 6.1	+ 4.7	+ 1.4	+ 3.2	+ 2.3	+ 0.8	+ 1.7	- 0.6	+ 3.2	+ 7.4	+ 5.3	+ 7.6	+ 6.3	+ 8.2	+ 2.3	+ 7.7	+ 9.9	+ 6.5	+ 6.8
19th	+ 7.0	+ 2.8	+ 4.5	+ 4.4	+ 1.7	+ 3.7	+ 2.3	+ 5.3	+ 5.1	+ 2.7	- 4.5	- 2.0	+ 0.5	+ 4.4	+ 5.3	+ 4.5	+ 3.2	+ 5.1	+ 5.0	+ 10.2	+ 9.0	+ 6.7	+ 6.1	+ 10.2
20th	+ 7.9	+ 6.3	+ 8.1	+ 5.6	+ 7.3	+ 8.1	+ 6.7	+ 6.8	+ 5.4	+ 2.1	- 2.6	0.0	+ 0.9	- 0.4	+ 0.8	+ 0.6	+ 2.4	+ 1.4	+ 2.6	- 0.6	+ 3.5	+ 2.2	+ 5.0	+ 0.6
21st	- 0.8	+ 4.1	+ 1.5	- 5.0	- 2.5	- 2.7	- 1.0	- 1.7	- 4.6	- 11.7	- 12.3	- 12.9	- 11.7	- 8.2	- 6.6	- 7.6	- 5.6	- 6.3	- 6.9	- 5.4	- 6.6	- 1.5	- 2.4	- 2.8
22d	+ 0.9	+ 0.4	+ 3.5	+ 5.8	+ 6.1	- 0.2	- 0.2	- 1.7	- 2.3	- 8.5	- 10.9	- 10.2	- 9.8	- 5.7	- 5.6	- 4.7	- 4.5	- 7.8	- 6.0	- 7.3	- 4.4	- 0.5	- 3.3	- 3.8
23d	- 0.1	+ 1.4	- 1.0	- 1.5	- 0.2	- 0.6	- 2.0	- 0.2	- 0.7	- 2.3	- 2.9	- 2.9	- 1.3	+ 0.9	- 0.1	- 1.0	- 2.5	- 4.9	- 3.5	- 1.9	+ 2.4	+ 5.9	+ 5.1	+ 0.2
24th	- 1.7	- 0.7	- 4.4	- 1.7	- 5.4	- 1.0	- 1.5	- 4.8	- 8.6	- 11.0	- 13.1	- 13.4	- 14.6	- 11.1	- 11.4	- 9.3	- 8.8	-	-	- 6.4	- 6.8	- 6.8	- 3.1	- 5.0
25th	- 4.8	- 2.5	- 2.9	- 5.2	- 4.3	- 4.2	- 3.0	- 2.0	- 2.8	- 6.8	- 11.9	- 13.0	- 11.8	- 7.8	- 3.8	- 2.7	- 2.6	- 0.6	- 3.9	- 2.2	- 2.5	- 1.7	- 0.3	+ 1.3
26th	- 0.9	- 2.0	- 1.7	- 1.9	- 2.4	- 1.8	- 2.3	- 1.2	- 3.2	- 6.0	- 8.2	- 8.6	- 5.6	- 2.1	- 1.7	- 1.1	- 2.5	- 2.3	- 2.6	- 2.1	- 2.4	- 1.9	- 1.3	- 1.1
27th	- 0.7	- 0.3	- 0.9	- 1.5	+ 0.2	+ 0.2	+ 0.1	+ 2.6	+ 1.0	- 1.8	+ 0.1	- 0.2	- 0.4	+ 2.6	+ 0.8	+ 4.5	+ 7.6	+ 1.3	+ 2.6	+ 5.9	+ 5.2	+ 0.5	+ 0.9	+ 5.8
28th	- 0.4	+ 5.1	+ 2.8	+ 5.4	+ 4.0	- 1.1	- 2.2	+ 0.5	- 2.9	- 6.1	- 8.7	- 11.1	- 11.6	- 4.9	- 5.2	- 3.7	- 2.8	- 4.9	- 3.0	- 3.0	- 2.3	- 4.0	- 4.9	- 4.3
29th	- 4.7	- 8.6	- 4.1	- 4.0	- 3.5	- 1.5	- 2.2	- 2.5	- 4.7	- 6.8	- 8.6	- 8.7	- 5.2	- 5.2	- 4.8	- 5.5	- 6.1	- 7.0	- 8.1	- 7.1	- 7.1	- 6.1	- 7.7	- 7.3
30th	- 6.0	- 1.9	- 3.0	- 3.2	- 3.7	- 3.5	- 3.1	- 3.5	- 5.2	- 8.0	- 9.2	- 10.0	- 8.7	- 6.7	- 4.8	- 4.2	- 3.5	- 1.3	- 1.6	- 2.5	- 2.3	- 3.0	- 2.0	+ 0.6
Means	+ 3.31	+ 4.23	+ 3.76	+ 3.05	+ 3.68	+ 3.81	+ 3.85	+ 3.41	+ 1.59	- 1.81	- 4.12	- 4.74	- 4.07	- 2.05	- 0.51	+ 0.18	+ 1.00	+ 0.99	+ 1.33	+ 1.04	+ 1.76	+ 2.23	+ 2.85	+ 3.08
Normals	+ 3.74	+ 3.93	+ 6.33	+ 6.05	+ 5.77	+ 4.68	+ 5.95	+ 3.71	+ 2.73	- 0.45	- 3.50	- 2.84	- 2.84	- 1.96	- 0.41	+ 0.56	+ 1.87	+ 2.85	+ 1.52	+ 0.71	+ 2.19	+ 2.33	+ 3.12	+ 4.40

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF DECEMBER 1862.

Value of a part of division = 0.0001,80.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 1.2	+ 0.9	+ 1.5	+ 1.2	+ 2.2	+ 2.6	+ 2.4	+ 1.7	+ 1.2	+ 0.3	- 4.1	- 6.9	- 11.7	- 12.8	- 7.4	- 5.9	- 5.5	- 7.1	- 7.2	- 5.8	- 10.8	- 7.4	- 8.5	- 7.7
2d	- 7.9	- 4.6	- 6.2	- 5.3	- 5.1	- 4.8	- 5.0	- 5.0	- 6.7	- 10.0	- 11.4	- 13.0	- 12.5	- 8.9	- 4.7	- 2.6	- 5.5	- 4.4	- 5.2	- 5.0	- 7.8	- 9.5	- 8.6	- 7.6
3d	- 7.6	- 4.2	- 5.5	- 1.0	- 1.6	+ 3.8	+ 1.3	+ 0.3	- 0.8	- 3.1	- 4.4	- 4.5	- 4.6	- 3.5	- 2.3	- 3.2	- 2.2	+ 0.1	+ 1.2	+ 0.4	+ 1.1	-	-	-
4th	+ 4.9	+ 5.3	+ 6.2	+ 4.4	+ 4.9	+ 6.7	+ 7.0	+ 8.9	+ 8.3	+ 4.1	- 0.6	- 2.2	+ 1.8	+ 5.6	- 0.2	+ 0.4	- 2.7	+ 2.2	+ 3.6	+ 4.7	+ 1.1	+ 4.3	+ 3.4	+ 2.2
5th	+ 8.1	+ 4.3	+ 6.6	+ 5.6	+ 2.4	+ 3.7	+ 7.1	+ 5.7	+ 4.7	+ 0.4	- 4.2	- 1.9	- 6.0	+ 1.7	+ 2.4	+ 1.0	+ 3.1	+ 2.2	+ 4.7	+ 5.1	+ 2.0	+ 6.1	+ 2.1	+ 4.3
6th	+ 7.1	+ 6.8	+ 7.9	+ 6.1	+ 11.9	+ 8.9	+ 8.5	+ 6.6	+ 4.7	+ 1.4	- 1.5	- 7.0	+ 0.5	+ 2.3	+ 2.5	+ 6.5	+ 7.0	+ 6.1	+ 5.0	+ 5.7	+ 4.5	+ 9.2	+ 6.6	+ 5.7
7th	+ 7.8	+ 8.9	+ 11.1	+ 9.6	+ 8.2	+ 10.6	+ 7.0	+ 9.5	+ 8.2	+ 0.7	- 1.7	+ 1.2	+ 3.3	+ 4.2	+ 7.8	+ 6.8	+ 9.2	+ 14.0	+ 10.0	+ 9.5	+ 9.6	+ 13.0	+ 16.7	+ 10.0
8th	+ 10.9	+ 12.5	+ 14.0	+ 10.3	+ 9.1	+ 11.4	+ 13.1	+ 14.0	+ 10.6	+ 6.4	+ 6.1	+ 5.5	+ 5.4	+ 1.8	+ 8.0	+ 8.8	+ 10.7	+ 12.2	+ 13.1	+ 11.8	+ 13.6	+ 14.7	+ 17.2	+ 16.0
9th	+ 4.8	+ 15.6	+ 15.3	+ 15.5	+ 12.4	+ 14.9	+ 16.9	+ 13.2	+ 12.3	+ 7.3	+ 1.9	- 3.4	- 6.9	- 2.5	+ 2.4	+ 1.5	+ 2.6	+ 4.1	+ 4.8	+ 4.0	+ 4.9	+ 5.1	+ 5.0	+ 7.4
10th	+ 7.0	+ 7.7	+ 7.4	+ 8.1	+ 8.0	+ 10.2	+ 10.6	+ 9.9	+ 7.1	+ 1.7	- 0.6	- 4.2	- 4.6	- 5.4	- 2.1	+ 0.5	+ 2.6	+ 2.9	+ 1.6	+ 1.8	+ 3.8	+ 4.5	+ 5.5	+ 5.9
11th	+ 6.9	+ 6.5	+ 7.1	+ 7.0	+ 8.7	+ 8.9	+ 10.6	+ 2.1	+ 10.5	+ 5.2	+ 2.3	+ 1.5	+ 1.4	+ 0.8	+ 2.3	+ 4.4	+ 6.4	+ 5.4	+ 7.3	+ 5.4	+ 6.7	+ 8.4	+ 8.9	+ 9.1
12th	+ 10.0	+ 9.5	+ 9.2	+ 9.7	+ 9.4	+ 11.4	+ 13.2	+ 12.6	+ 12.2	+ 7.3	+ 5.8	+ 3.8	+ 0.3	+ 0.9	+ 3.4	+ 7.0	+ 7.2	+ 6.5	+ 6.9	+ 7.7	+ 6.9	+ 7.0	+ 7.7	+ 7.0
13th	+ 5.1	+ 5.4	+ 5.5	+ 9.0	+ 9.1	+ 6.6	+ 7.1	+ 6.6	+ 5.5	+ 4.3	+ 4.3	+ 2.4	+ 1.2	+ 1.7	+ 2.9	+ 3.2	+ 2.7	+ 1.1	- 0.3	+ 1.4	+ 2.5	+ 1.7	+ 4.9	+ 3.5
14th	+ 4.9	+ 5.4	+ 5.1	+ 4.4	+ 5.4	+ 7.4	+ 7.9	+ 8.8	+ 4.4	+ 4.0	+ 1.9	- 0.6	- 1.6	- 3.8	+ 6.3	+ 7.6	+ 7.8	+ 6.5	+ 8.9	+ 10.7	+ 9.5	+ 9.8	+ 6.9	+ 1.7
15th	+ 0.2	- 1.5	+ 17.0	+ 4.5	+ 0.4	- 16.4	- 29.0	- 39.4	- 44.5	- 46.7	- 49.1	- 47.2	-	- 26.1	- 18.8	- 16.6	- 12.4	- 14.0	- 12.9	- 8.9	-	-	-	-
16th	- 7.7	- 6.4	- 4.6	- 4.8	- 4.7	- 3.3	- 1.6	- 1.4	- 1.8	- 5.7	- 6.6	- 5.2	- 2.0	- 1.2	+ 3.5	+ 0.1	+ 1.8	+ 0.8	- 3.1	- 3.0	- 3.0	- 1.3	- 3.2	- 2.0
17th	- 0.9	- 1.9	+ 1.2	+ 1.2	+ 0.3	+ 1.4	+ 1.5	+ 2.0	+ 0.6	- 4.2	- 5.6	- 6.5	- 5.0	- 3.3	- 1.0	+ 0.9	- 0.9	- 5.7	- 5.6	- 3.2	- 1.7	+ 1.0	+ 0.1	+ 0.9
18th	+ 3.3	+ 4.8	+ 4.7	+ 3.4	+ 2.2	+ 4.1	+ 4.2	+ 4.7	- 1.2	- 2.8	- 2.3	- 1.9	- 2.9	- 0.4	+ 2.5	+ 3.3	+ 4.3	+ 4.7	+ 4.3	+ 4.9	+ 6.9	+ 7.1	+ 6.5	+ 7.9
19th	+ 6.7	+ 7.4	+ 6.1	+ 5.5	+ 6.2	+ 7.1	+ 7.7	+ 6.8	+ 5.9	+ 2.0	- 1.9	- 2.5	- 2.7	+ 1.0	+ 2.2	+ 5.6	+ 7.6	+ 5.6	+ 6.0	+ 6.9	+ 7.0	+ 7.0	+ 6.7	+ 9.0
20th	+ 9.0	+ 7.1	+ 8.3	+ 8.1	+ 9.1	+ 9.7	+ 9.9	+ 8.5	+ 6.6	+ 2.3	- 0.5	- 0.1	+ 4.5	+ 6.6	+ 9.9	+ 10.2	+ 10.2	+ 10.0	+ 10.6	+ 10.0	+ 10.9	+ 10.5	+ 10.9	+ 10.6
21st	+ 11.7	+ 9.7	+ 10.2	+ 11.6	+ 10.6	+ 10.6	+ 11.5	+ 8.1	+ 7.1	+ 3.4	+ 1.4	- 0.3	+ 2.0	+ 6.3	+ 7.5	+ 7.7	+ 6.3	+ 5.6	+ 4.9	+ 5.3	+ 6.0	+ 6.1	+ 7.3	+ 7.3
22d	+ 12.4	+ 7.6	+ 5.7	+ 6.3	+ 7.0	+ 8.1	+ 7.4	+ 8.7	+ 6.6	+ 2.8	- 0.6	- 4.0	- 1.5	+ 3.6	+ 6.6	+ 10.2	+ 10.7	+ 10.9	+ 10.8	+ 8.4	+ 8.6	+ 7.4	+ 8.4	+ 10.2
23d	+ 7.9	+ 7.5	+ 8.2	+ 9.3	+ 9.9	+ 10.7	+ 11.6	+ 10.5	+ 9.2	+ 4.8	+ 0.9	- 0.4	+ 0.5	+ 1.2	+ 10.6	+ 13.0	+ 8.6	+ 8.6	+ 1.6	- 3.6	+ 2.1	+ 5.0	+ 4.8	+ 8.6
24th	+ 7.8	+ 9.7	+ 11.1	+ 5.3	+ 5.8	+ 8.5	+ 9.9	+ 8.8	+ 8.7	+ 6.5	+ 4.0	- 0.4	- 0.9	+ 1.8	+ 3.7	+ 9.3	+ 6.2	+ 7.0	+ 4.5	+ 1.4	+ 0.1	- 1.9	- 2.9	- 2.4
25th	- 0.8	+ 3.0	+ 9.9	+ 3.2	+ 12.9	+ 11.1	+ 8.6	+ 1.0	- 5.0	- 15.0	- 19.9	- 19.8	- 21.5	- 19.0	- 16.1	- 13.3	- 11.9	- 15.5	- 15.3	- 17.9	- 13.7	- 9.3	- 6.2	- 5.9
26th	+ 0.3	- 3.2	- 1.5	- 0.1	- 2.6	0.0	- 2.0	- 0.3	-	- 2.4	- 5.7	- 7.6	- 5.3	- 4.8	- 1.2	+ 0.1	- 0.3	- 5.5	- 5.2	- 5.1	- 6.5	- 9.8	- 10.5	- 7.5
27th	- 2.5	- 3.5	- 6.3	- 4.0	- 6.1	+ 0.8	- 6.5	- 6.6	- 9.3	- 11.6	- 12.0	- 11.6	- 10.3	- 6.5	- 4.5	- 6.1	- 7.2	- 8.5	- 7.9	- 8.3	- 7.4	- 6.0	- 6.3	- 6.1
28th	- 3.4	- 3.1	- 3.2	- 4.9	- 3.2	- 2.8	- 1.4	+ 1.4	+ 2.2	- 0.7	- 4.2	- 7.5	- 11.0	- 11.9	- 8.9	- 5.2	- 3.6	- 1.4	- 2.2	- 1.0	- 2.4	- 2.6	- 3.3	- 2.7
29th	- 2.7	- 2.1	- 2.9	- 2.4	- 1.8	- 1.4	- 2.2	- 2.7	- 3.8	- 4.0	- 5.6	- 6.2	- 5.9	- 3.9	- 3.5	- 1.7	- 2.8	- 3.9	- 4.7	- 5.7	- 4.3	- 3.7	- 3.4	- 1.5
30th	- 1.3	+ 1.4	+ 1.5	+ 1.8	+ 1.3	+ 1.9	+ 1.4	+ 0.7	+ 0.1	- 1.2	- 1.8	- 0.9	- 1.1	- 1.4	- 0.7	- 0.2	- 2.5	- 2.1	- 2.6	- 0.9	- 0.8	- 0.9	- 1.1	+ 1.4
31st	+ 3.7	+ 4.7	+ 6.7	+ 7.3	+ 7.4	+ 7.2	+ 7.5	+ 7.5	+ 5.4	-	+ 3.2	+ 2.4	+ 1.2	- 0.7	- 1.3	- 0.2	+ 0.3	- 3.4	- 0.5	- 1.2	+ 1.7	+ 2.2	+ 1.0	+ 2.2
Means	+ 3.45	+ 3.91	+ 5.07	+ 4.38	+ 4.51	+ 5.15	+ 4.72	+ 3.65	+ 2.30	- 1.42	- 3.63	- 4.81	- 3.20	- 2.47	+ 0.38	+ 1.71	+ 1.87	+ 1.45	+ 1.20	+ 0.80	+ 1.70	+ 2.68	+ 2.64	+ 3.02
Normals	+ 4.80	+ 6.18	+ 6.72	+ 5.43	+ 6.08	+ 7.23	+ 6.72	+ 5.07	+ 4.17	+ 0.60	- 1.98	- 3.11	- 1.69	- 0.94	+ 0.87	+ 2.32	+ 2.42	+ 2.63	+ 2.65	- 0.24	+ 2.25	+ 3.97	+ 4.99	+ 3.77

FLAGSTAFF OBERVATORY.

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF JANUARY 1863.

Value of a part of division = 0.0001,80.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1st	+ 2.0	+ 0.5	+ 1.8	+ 2.2	+ 4.9	+ 3.8	+ 3.3	+ 4.0	- 0.2	- 2.7	- 4.8	- 5.6	- 5.1	- 2.5	- 2.6	- 1.5	- 7.6	- 4.9	- 2.9	+ 1.4	- 2.3	+ 3.0	- 2.5	- 1.5
2d	+ 2.3	+ 2.3	- 3.4	- 1.4	- 4.0	- 5.4	- 6.1	- 7.1	- 8.2	- 13.2	- 16.1	- 15.0	- 11.7	- 10.9	- 10.4	- 9.4	- 8.0	- 8.5	- 6.0	- 3.6	- 3.7	- 3.1	- 2.2	- 1.7
3d	- 3.0	- 0.3	- 0.1	+ 0.4	+ 0.8	+ 0.3	- 0.4	- 1.5	- 6.2	- 8.4	- 8.9	- 9.4	- 11.6	- 13.0	- 12.1	- 10.7	- 9.7	- 7.6	- 8.5	- 7.8	- 8.5	- 5.9	- 5.3	- 3.0
4th	+ 2.7	- 0.3	- 2.1	- 1.9	- 1.0	- 0.6	- 0.1	- 1.1	- 2.8	- 6.7	- 8.8	- 6.8	- 5.9	- 4.2	+ 0.4	+ 0.6	- 2.7	+ 1.7	+ 1.7	+ 1.2	+ 5.3	+ 4.3	+ 3.6	+ 4.0
5th	+ 5.2	+ 10.5	+ 3.5	+ 7.2	+ 7.5	+ 12.1	+ 10.1	+ 9.6	+ 8.1	+ 5.1	+ 2.3	- 1.0	+ 0.4	+ 1.8	+ 4.9	+ 6.1	+ 6.3	+ 4.9	+ 4.2	+ 4.2	+ 3.8	+ 3.4	+ 2.1	+ 1.7
6th	+ 5.7	+ 3.9	+ 3.9	+ 3.3	+ 2.8	+ 4.2	+ 2.9	- 0.4	- 4.2	- 3.3	- 5.6	- 6.9	- 3.9	- 2.1	- 0.8	+ 1.2	+ 1.3	- 0.7	- 0.3	- 0.9	+ 1.6	+ 1.8	+ 3.5	-
7th	+ 4.6	+ 3.7	+ 7.9	+ 6.5	+ 5.1	+ 7.4	+ 6.7	+ 3.9	+ 1.1	- 3.5	- 9.8	- 9.7	- 9.3	- 4.6	- 4.7	- 8.8	- 5.2	- 3.4	- 4.4	- 3.8	- 2.2	- 2.0	- 0.8	- 1.3
8th	0.0	+ 1.4	- 0.2	+ 1.0	+ 1.3	+ 2.9	+ 2.0	+ 2.1	- 1.3	- 3.7	- 6.5	- 7.9	- 10.1	- 8.2	- 4.8	- 3.4	- 2.1	- 1.6	- 1.6	- 4.7	- 4.7	- 4.1	- 3.8	- 5.6
9th	- 4.2	- 0.1	- 3.1	- 6.9	- 5.3	- 8.2	- 3.3	- 5.1	- 8.4	- 14.3	- 17.6	- 19.7	- 22.8	- 18.4	- 8.6	- 4.7	-	- 2.7	- 4.1	- 4.6	- 3.9	- 2.3	- 1.4	- 1.8
10th	+ 0.5	+ 0.9	+ 1.3	- 0.1	- 1.1	- 1.9	- 2.5	- 0.4	- 1.5	- 5.0	- 9.3	- 12.7	- 7.8	- 5.9	- 4.7	0.0	- 2.9	- 3.2	- 2.2	- 2.8	- 1.3	+ 0.5	- 2.9	+ 2.8
11th	+ 0.6	+ 2.7	+ 4.1	+ 5.5	+ 2.8	+ 1.5	+ 0.6	+ 2.2	+ 5.3	- 1.1	- 4.6	- 6.1	- 4.8	- 4.8	- 3.9	- 1.5	+ 1.2	+ 2.2	- 1.5	- 1.3	+ 2.0	+ 3.3	+ 6.4	+ 4.7
12th	+ 3.4	+ 9.2	+ 6.6	+ 1.6	+ 2.5	0.0	+ 0.8	- 0.2	- 0.5	- 5.5	- 10.5	- 12.9	- 11.2	- 5.9	- 5.0	- 3.3	- 4.9	+ 0.6	- 0.1	- 3.8	- 1.7	+ 4.8	+ 1.4	+ 1.5
13th	+ 1.5	+ 2.1	+ 6.0	+ 5.2	+ 3.8	+ 1.1	- 1.5	+ 1.6	+ 0.9	-	- 3.6	- 5.5	- 7.3	- 3.8	- 5.6	- 2.0	+ 1.9	- 2.0	+ 2.3	+ 0.2	+ 3.1	+ 4.3	+ 3.8	+ 3.6
14th	+ 8.3	+ 6.7	+ 6.4	+ 4.9	+ 5.6	+ 7.1	+ 6.8	+ 7.1	+ 6.2	+ 4.9	+ 2.9	+ 2.2	+ 3.3	+ 2.4	+ 4.7	+ 6.0	+ 10.1	+ 13.2	+ 11.7	+ 9.3	+ 8.7	+ 9.5	+ 12.3	+ 2.9
15th	+ 9.5	+ 10.9	+ 16.5	+ 15.1	+ 11.7	+ 12.8	+ 11.4	+ 13.3	+ 12.8	+ 10.8	+ 7.0	+ 6.4	+ 7.5	+ 7.8	+ 8.4	+ 6.2	+ 10.9	+ 11.1	+ 14.5	+ 8.2	+ 13.1	+ 7.8	+ 7.0	+ 6.6
16th	+ 7.3	+ 7.8	+ 10.5	+ 11.5	+ 7.4	+ 5.7	+ 6.5	+ 6.4	+ 4.1	+ 3.5	+ 2.2	+ 0.4	- 1.9	- 0.7	+ 1.5	+ 3.1	+ 3.3	+ 3.6	+ 0.7	+ 0.6	+ 4.4	+ 4.0	+ 4.7	+ 4.9
17th	+ 7.5	+ 4.3	+ 6.6	+ 7.8	+ 7.1	+ 4.8	+ 3.2	+ 1.2	- 0.6	- 0.1	+ 1.5	+ 0.4	+ 0.1	- 0.2	- 1.7	-	- 3.3	- 2.4	- 2.3	- 1.3	- 1.4	- 1.1	- 0.6	- 1.3
18th	+ 1.8	- 1.3	+ 11.2	- 0.2	- 0.2	- 0.6	+ 0.2	- 1.3	0.0	+ 0.5	- 0.5	- 1.1	- 1.5	- 1.6	- 0.2	+ 2.3	+ 2.3	+ 2.7	+ 1.7	+ 3.0	+ 3.6	+ 2.3	+ 1.4	+ 3.7
19th	+ 4.6	+ 4.4	+ 5.9	+ 5.7	+ 5.7	+ 5.9	+ 5.2	+ 4.3	+ 0.6	+ 4.2	+ 5.8	+ 6.8	+ 6.3	+ 6.9	+ 8.2	+ 8.9	+ 9.8	+ 10.3	+ 10.7	+ 9.9	+ 9.4	+ 8.5	+ 8.6	+ 7.4
20th	+ 8.5	+ 5.5	+ 11.5	+ 8.4	+ 9.4	+ 10.5	+ 10.8	+ 6.6	+ 3.4	+ 4.4	+ 6.4	+ 6.8	+ 9.2	+ 11.1	+ 13.5	+ 15.1	+ 13.9	+ 14.2	+ 12.2	+ 12.2	+ 12.7	+ 12.1	+ 11.3	+ 11.4
21st	+ 12.7	+ 11.6	+ 11.9	+ 12.4	+ 14.1	+ 13.8	+ 14.3	+ 11.6	+ 7.4	+ 3.4	+ 1.3	+ 3.1	+ 5.9	+ 8.3	+ 9.7	+ 10.6	+ 10.9	+ 10.7	+ 12.0	-	+ 12.0	+ 12.3	+ 13.2	+ 13.1
22d	+ 14.1	+ 12.8	+ 13.1	+ 13.7	+ 15.8	+ 15.8	+ 16.2	+ 13.4	+ 11.8	+ 4.4	+ 2.4	+ 3.0	+ 3.6	+ 5.1	+ 3.8	+ 0.3	- 0.2	+ 1.0	+ 0.5	+ 1.1	+ 3.3	+ 4.9	+ 6.6	+ 5.2
23d	+ 5.0	+ 6.1	+ 6.1	+ 6.6	+ 5.6	+ 6.8	+ 6.3	+ 6.0	-	- 0.9	- 0.1	- 2.9	+ 1.9	+ 5.3	+ 8.1	+ 9.3	+ 11.3	+ 11.8	+ 12.8	+ 14.2	-	+ 14.3	+ 12.9	+ 11.2
24th	+ 10.8	+ 9.9	+ 12.1	+ 12.8	+ 14.5	+ 15.2	+ 13.7	+ 11.5	+ 10.1	+ 2.5	+ 2.4	+ 0.1	- 0.1	- 3.7	- 7.2	- 9.0	- 5.7	- 11.8	- 7.9	- 8.7	- 9.1	- 11.2	- 11.4	- 7.2
25th	+ 20.1	+ 20.2	+ 13.9	+ 12.9	-	+ 13.7	+ 3.8	- 8.2	- 2.7	- 4.3	+ 0.8	+ 4.4	- 1.3	+ 2.7	+ 9.1	- 10.0	+ 6.4	+ 10.8	+ 8.1	+ 7.9	+ 13.1	+ 11.5	+ 15.4	+ 19.6
26th	+ 8.1	+ 5.3	+ 7.5	+ 10.8	+ 5.5	+ 13.9	+ 10.9	+ 10.2	+ 13.1	+ 9.9	+ 0.8	- 0.2	- 3.0	+ 3.5	+ 0.7	+ 6.7	+ 7.6	+ 11.5	+ 7.1	+ 5.0	- 0.7	- 1.5	+ 0.4	- 4.5
27th	+ 6.2	+ 2.2	+ 2.1	+ 5.0	+ 0.5	+ 4.7	+ 2.6	+ 1.1	- 4.0	- 2.5	- 3.0	- 3.4	- 3.7	- 0.6	+ 1.8	+ 5.2	+ 3.1	+ 3.5	+ 4.9	+ 5.5	+ 3.7	+ 3.0	+ 5.4	+ 5.8
28th	+ 7.7	+ 2.3	+ 6.7	+ 3.4	+ 3.1	+ 2.6	+ 2.9	+ 0.6	+ 1.7	+ 1.4	+ 1.1	- 1.0	- 2.2	- 1.3	- 2.3	- 2.2	- 0.9	+ 0.3	+ 0.6	+ 1.2	+ 0.9	+ 0.5	+ 0.2	+ 0.4
29th	+ 4.2	+ 3.0	+ 2.5	+ 4.0	+ 3.2	+ 2.0	+ 3.1	+ 2.7	+ 3.2	+ 0.8	- 3.6	- 6.5	- 5.5	- 4.1	-	- 2.9	- 4.5	- 3.5	- 2.6	- 1.9	- 1.8	- 1.5	- 1.0	- 0.5
30th	+ 3.4	+ 2.5	- 8.4	- 1.7	- 5.2	- 1.5	- 4.7	- 4.4	- 8.7	- 8.2	- 7.2	- 8.7	- 15.8	- 15.5	- 10.4	- 9.1	- 7.5	- 5.8	- 4.4	- 4.8	- 2.4	- 0.3	- 0.5	- 0.6
31st	+ 2.2	+ 1.5	+ 1.6	+ 2.7	+ 4.4	+ 3.8	+ 5.2	+ 4.0	-	- 3.6	- 3.6	- 10.5	- 15.1	- 11.9	+ 1.8	- 1.7	+ 2.2	0.0	- 7.0	- 5.0	- 2.1	+ 3.5	+ 7.6	+ 0.6
Means	+ 5.27	+ 5.04	+ 5.29	+ 5.11	+ 4.27	+ 4.97	+ 4.22	+ 3.02	+ 1.60	- 1.04	- 2.81	- 3.87	- 3.98	- 2.23	- 0.28	+ 0.05	+ 1.24	+ 1.81	+ 1.61	+ 1.00	+ 1.83	+ 2.83	+ 3.08	+ 2.74
Normals	+ 4.75	+ 3.47	+ 5.45	+ 4.11	+ 3.77	+ 3.09	+ 3.34	+ 2.33	+ 0.81	- 0.33	- 1.25	- 4.29	- 3.74	- 2.19	- 0.88	+ 0.72	+ 0.07	+ 0.06	- 0.52	- 0.69	+ 0.16	+ 2.13	+ 2.21	+ 1.92

MAGNETIC HORIZONTAL FORCE DURING THE MONTH OF FEBRUARY 1863.

Value of a part of division = 0.0001,80.

DAY of the MONTH	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1 st	+ 6.5	+12.1	+11.7	+10.2	—	+10.1	+ 7.6	+ 6.2	+ 1.4	— 3.2	— 2.6	— 2.4	— 4.1	— 3.6	— 0.9	— 0.3	+ 1.3	+ 0.9	—	— 0.1	— 0.2	+ 0.4	+ 1.1	+ 1.9
2 ^d	+ 2.8	+ 4.6	+ 4.7	+ 3.4	+ 2.1	+ 1.8	+ 1.6	+ 2.7	— 2.3	— 5.7	— 7.9	— 7.9	— 8.9	— 8.0	— 5.5	— 4.7	— 3.9	+ 1.2	— 8.0	— 5.2	— 0.4	— 3.9	— 0.4	+ 4.3
3 ^d	+ 2.0	+ 4.5	+ 8.3	+ 3.0	+ 1.4	+ 1.1	+ 2.0	— 0.1	+ 0.4	— 2.8	— 4.9	+ 1.4	+ 4.1	+ 4.4	+ 5.3	+ 4.2	+ 2.4	+ 4.6	+ 3.3	+ 4.1	+ 4.7	+ 6.4	+ 5.6	+ 6.9
4 th	+ 5.3	+ 5.5	+ 5.4	+ 7.0	+ 7.2	+ 7.5	+ 9.8	+ 7.3	+ 4.3	+ 3.1	+ 3.3	+ 0.5	— 2.7	— 2.9	— 0.1	+ 1.0	+ 1.6	+ 2.5	+ 2.2	+ 2.2	—	+ 4.9	+ 3.9	+ 5.7
5 th	+ 4.6	+ 6.3	+ 9.1	+ 6.0	+ 5.4	+ 4.8	+ 6.7	+ 6.1	+ 2.7	— 3.7	— 7.3	— 9.4	— 6.9	— 5.5	— 2.6	— 0.1	+ 2.6	+ 2.9	+ 0.9	+ 1.0	+ 0.7	+ 2.5	+ 2.9	+ 3.3
6 th	+ 5.0	+ 5.1	+ 4.5	+ 3.6	+ 4.0	+ 3.7	+ 4.7	+ 5.7	+ 3.4	— 0.9	— 4.6	— 6.1	— 6.6	— 5.2	— 2.1	+ 0.1	+ 3.9	+ 3.0	+ 5.2	+ 7.2	+ 3.6	+ 7.5	+ 4.4	+ 5.6
7 th	+ 6.9	+ 9.7	+ 6.6	+ 7.8	+ 5.0	+ 6.6	+ 7.8	+ 8.1	+ 7.2	+ 3.6	— 0.6	+ 1.0	+ 3.6	+ 7.1	+12.2	+ 3.6	+ 4.1	+ 7.3	+ 9.8	+ 7.8	+12.1	+ 3.7	+ 1.3	+ 3.0
8 th	+ 2.6	+ 2.4	+ 7.5	+11.7	+ 9.7	+ 8.4	+ 2.6	+ 4.6	+ 3.6	+ 2.1	— 0.6	— 3.2	— 1.6	+ 0.5	— 3.8	— 2.5	+ 2.1	+ 8.0	+ 5.1	+ 7.2	+ 5.2	+ 8.1	+ 6.8	+10.6
9 th	+14.9	+ 8.6	+ 8.0	+ 7.9	+ 9.5	+11.8	+ 9.9	+ 5.3	+ 3.7	— 0.9	— 5.6	—12.5	— 4.3	— 1.3	— 0.1	+ 1.5	+ 1.4	+ 1.7	+ 2.4	+ 3.1	— 0.5	+ 0.9	+ 2.2	— 0.3
10 th	+ 1.8	+ 0.2	+ 0.4	+ 3.4	+ 1.6	+ 1.7	+ 2.2	+ 2.7	+ 0.4	— 3.8	— 8.7	—11.5	—11.2	— 7.2	— 3.5	— 2.5	—	— 0.3	— 1.9	+ 1.0	— 0.1	+ 1.8	+ 1.4	+ 2.4
11 th	+ 2.8	+ 4.9	+ 4.0	+ 3.4	+ 5.0	+ 3.9	+ 3.4	+ 2.3	+ 1.1	— 0.5	— 2.1	— 4.0	— 4.4	— 4.9	— 2.0	+ 0.4	+ 0.7	+ 0.9	+ 0.5	+ 4.0	—	+ 2.5	+ 1.5	+ 5.5
12 th	+ 1.6	+ 1.0	+ 2.9	+ 2.7	+ 4.8	+ 4.7	+ 4.7	+ 4.6	+ 3.2	— 1.2	— 4.4	— 5.0	+ 1.0	— 1.0	+ 1.0	+ 1.8	+ 0.5	+ 0.6	+ 1.9	+ 3.5	+ 2.0	+ 2.9	+ 2.9	+ 2.5
13 th	+ 4.5	+ 4.5	+ 4.0	+ 2.4	+ 4.3	+ 3.4	+ 3.8	+ 2.7	+ 2.9	+ 3.0	+ 0.4	— 3.3	— 4.2	— 4.8	— 2.9	— 2.9	— 0.2	+ 1.4	+ 1.6	+ 1.2	+ 3.0	+ 3.2	+ 2.8	+ 2.4
14 th	+ 4.1	+ 4.8	+ 5.1	+ 2.1	+ 2.4	+ 1.2	+ 4.4	+ 2.7	— 0.3	— 3.4	— 4.6	— 4.5	— 5.0	— 2.7	— 0.8	+ 0.9	+ 1.2	+ 0.1	+ 0.8	+ 0.9	+ 1.0	+ 1.3	+ 0.4	+ 1.2
15 th	+ 1.8	+ 2.4	+ 1.9	+ 1.9	+ 2.2	+ 1.0	+ 1.9	— 0.1	— 1.3	— 3.7	— 4.8	— 5.5	— 5.4	— 5.0	— 3.4	— 2.6	— 5.5	+ 0.6	+ 1.4	+ 2.6	+ 3.1	+ 3.8	+ 2.9	+ 1.8
16 th	— 1.9	+ 2.2	+ 2.8	+ 3.0	— 1.5	+ 1.6	+ 0.5	+ 2.1	— 2.5	— 6.7	— 8.9	— 9.5	— 8.6	— 4.6	— 1.5	+ 0.3	0.0	— 1.3	— 2.8	— 1.1	— 2.2	— 1.9	— 2.1	— 1.3
17 th	— 1.8	— 0.2	— 1.2	— 0.8	+ 1.1	+ 1.3	0.0	—10.7	—12.8	— 6.1	— 8.6	— 8.8	— 6.4	— 4.5	— 0.8	+ 0.5	+ 1.3	+ 3.0	+ 2.3	+ 1.5	+ 2.6	+ 2.0	+ 1.4	+ 3.3
18 th	+ 1.6	+ 1.7	+ 2.1	+ 3.1	+ 4.8	+ 2.9	+ 3.6	+ 2.3	— 0.2	— 4.5	— 6.7	— 6.8	— 4.6	— 1.7	— 1.1	+ 1.3	+ 3.9	+ 4.3	+ 5.5	+ 5.5	+ 5.2	+ 4.2	+ 6.0	+ 5.4
19 th	+ 6.0	+ 6.2	+ 4.0	+ 2.9	—	+ 1.2	— 1.7	+ 6.0	+ 3.7	— 1.7	— 1.6	— 0.2	— 1.3	— 3.1	— 2.8	— 2.1	— 2.7	— 0.8	+ 1.3	+ 2.6	+ 5.0	+ 4.5	+ 4.2	+ 4.3
20 th	+ 3.3	+ 3.5	+ 4.9	+ 5.4	+ 4.1	+ 4.4	+ 6.5	+ 6.1	+ 4.6	+ 1.4	— 0.2	— 3.0	— 2.1	— 0.2	+ 1.5	+ 0.9	+ 3.4	+ 2.8	+ 2.3	+ 3.0	+ 3.1	+ 3.4	+ 4.1	+ 2.7
21 st	+ 3.4	+ 3.6	— 6.0	+ 4.3	+ 4.8	+ 5.3	+ 6.6	+ 5.8	+ 4.1	— 0.2	— 1.9	— 4.5	— 5.7	— 5.8	— 3.1	+ 1.0	+ 0.9	+ 2.5	+ 3.2	+ 3.6	+ 3.9	+ 3.6	+ 4.1	+ 4.1
22 ^d	+ 6.7	+ 5.8	+ 5.7	+ 6.1	+ 6.3	+ 4.7	+ 8.2	+ 7.6	+ 6.2	+ 2.8	— 1.7	— 5.1	— 5.8	— 4.6	— 2.6	— 0.5	+ 2.8	+ 4.5	+ 5.2	+ 5.5	+ 5.8	+ 5.3	+ 4.5	+ 5.1
23 ^d	+ 3.8	+ 7.0	+ 3.5	+ 5.4	+ 6.4	+ 7.5	+ 7.4	+ 5.4	— 0.4	— 1.5	— 5.8	— 9.8	—10.1	— 5.4	— 4.7	— 1.7	— 1.1	— 3.0	— 0.8	+ 2.7	+10.2	+ 0.7	+ 3.5	+ 4.9
24 th	+ 7.5	+ 7.9	+11.2	+11.4	+11.0	+10.3	+ 8.5	+13.4	—	+ 6.4	+ 4.8	+ 3.9	+ 2.5	+ 1.1	+ 7.1	+10.9	+15.8	+11.5	+13.2	+16.3	+16.0	+17.2	+16.6	+17.2
25 th	+16.9	+17.7	+15.0	+18.3	+18.2	+18.6	+17.7	+14.4	+14.1	+ 9.2	+ 4.6	+ 4.5	+ 7.1	+ 3.3	+ 1.6	+ 2.9	+ 7.5	+ 5.8	+ 5.6	+ 4.6	+ 6.4	+ 4.9	+ 8.0	+14.2
26 th	+ 9.8	+ 5.9	+ 3.3	+ 7.9	+ 6.8	+10.6	+ 8.1	— 0.9	+ 3.8	+ 0.1	— 6.6	— 6.6	— 7.8	— 0.8	— 9.6	— 9.6	— 5.3	+ 6.1	— 5.6	+ 0.6	+ 6.3	— 2.3	+ 5.7	+ 2.1
27 th	+ 3.4	+ 4.9	— 0.5	+ 7.7	+ 4.1	+ 6.5	+ 6.2	+ 5.4	+14.1	— 0.2	— 5.9	— 7.1	— 3.7	— 1.3	— 1.0	— 0.2	+ 0.9	— 3.9	+ 3.0	+ 1.1	+ 5.6	+ 6.4	+ 7.6	+ 5.6
28 th	+ 5.8	+ 5.6	+ 5.6	+ 5.7	+ 6.0	+ 5.7	+ 5.8	+ 4.2	+ 3.3	+ 0.4	— 1.5	— 1.6	— 3.5	— 1.3	—	— 1.0	+ 1.6	+ 2.5	+ 3.7	+ 5.0	+ 4.9	+ 5.5	+ 6.2	+ 6.7
Means	+ 4.70	+ 5.30	+ 4.80	+ 5.60	+ 5.06	+ 5.44	+ 5.37	+ 4.35	+ 2.53	— 0.66	— 3.39	— 4.54	— 3.81	— 2.46	— 0.97	+ 0.02	+ 1.53	+ 2.50	+ 2.27	+ 3.26	+ 4.12	+ 3.55	+ 3.91	+ 4.68
Normals	+3.84	+4.56	+4.55	+5.13	+4.74	+4.69	+5.17	+4.19	+2.21	—1.32	—4.31	—4.64	—4.90	—3.10	—1.79	—0.03	+1.51	+2.16	+2.26	+3.09	+2.99	+3.32	+3.44	+3.56

13. The values of the scale divisions, as given in the above tables, had been only preliminarily adopted, the angles of deflection having been derived from too small a number of observations, and they too made merely by the aid of large magnets placed on the stand for the telescopes, perpendicular to the direction of the needle. By a complete discussion of a larger series of observations, combined with the results of trigonometrical calculations of the angle of deflection, based upon exact measurements of the various distances, the respective values of the scale divisions were somewhat increased. When, however, all the monthly tables were reduced, a rigid examination was instituted for the purpose of deciding definitively upon the values of a scale division of the magnetometer for the various periods of observation. This was considered especially advisable on account of the torsion of the thread of suspension, which, notwithstanding all our precautions to remove it, or at least to reduce it to a minimum, was in this case still very considerable. The result of this discussion, in conjunction with another, concerning the ratio of the disturbed hours to the total number of hours of observation, induced me to retain the values originally fixed upon. The complete results are therefore as follows:

- (1.) For the period from the 1st of May to the 31st of October, 1860,

$$\frac{dX}{X} = (n' - n) 1.49 + 0.045 n.$$

- (2.) For the period from the 1st of November, 1860, to the 31st of May, 1861,

$$\frac{dX}{X} = (n' - n) 1.93 + 0.040 n.$$

- (3.) For the period from the 1st of June, 1861, to the 31st of June, 1862,

$$\frac{dX}{X} = (n' - n) 1.84 - 0.090 n.$$

- (4.) For the period from the 1st of July to the 31st of September, 1862,

$$\frac{dX}{X} = (n' - n) 1.84 + 0.048 n.$$

- (5.) For the period from the 1st of October, 1862, to the end of February, 1863,

$$\frac{dX}{X} = (n' - n) 1.80 - 0.017 n.$$

In the construction of the Diurnal Variation Tables, the second term was neglected.

The value of u has, in each of these cases, been adopted to be equal to the corresponding value in the declinometer. A determination of this value for the various periods, executed by the aid of small deflectors and the magnetic theodolite, gave values differing on an average from those obtained in the usual manner by 0.017 of a minute, the latter exceeding the former. This difference, however, was not taken into consideration, as there existed other causes interfering more seriously with an exact determination of the value of a scale division, the value of p , to wit, the effect of local influences. This value was only determined for the first period, when it amounted to 0.99692, a mean value derived from observations made towards the East of the Meridian of the University and not more than half a mile from the Observatory, being taken as the standard value of the horizontal force at Melbourne. Subsequently, while at the Flagstaff Observatory, this value was not further taken into account, for reasons fully explained in the Introduction. Observations on the horizontal force, made at the New Observatory, both previous to and after the erection of the Horary House, proved that the alterations on the ground had produced no change in the horizontal force, and p was consequently regarded as equal to

unity. The above values yield also results agreeing well, in every respect, with those derived from other sets of observations made at other localities.

It must be remarked that, by an error of print on page 58, the value of the scale division has been stated to be 0.0001,16 instead of 0.0001,84.

14. Treatment of the original readings in order to obtain the tables above printed. The original readings were further affected by the change in torsion of the thread of suspension and the loss in magnetic force of the deflecting bars. The effects of these influences had to be separated from the actual motions in the horizontal force, in order to be able to recognize the latter quite plainly and correctly. In doing this, it was considered necessary to treat the two conjointly; and the problem, therefore, to be solved was, to ascertain the sum of these influences interfering with the motion of the needle of the magnetometer, and to free the original readings from them. For this purpose a *graphical* method suggested itself as being at once the most simple and the most reliable of the various ways which might have been chosen.

The monthly means, as derived from the original readings, were entered in a diagram as ordinates, the months and subdivisions thereof forming the abscissae. These monthly means were then connected by a continuous curve, whereby we were at once enabled to recognize the changes in the interfering influences above pointed out, which had taken place in the course of each single month. If we apply these changes to the original readings with a reversed algebraic sign, we eliminate the influences interfering with the exact reading of the instruments; and what remains must therefore be considered as the true motion in the horizontal force. In addition to this, another alteration had yet to be applied to the readings in order to reduce them to the same standard, and the whole set of tables of hourly registrations on horizontal force became at once comparable. It is, however, yet to be remarked, in cases in which the curvature of the connecting line was so strong throughout the month as to make it impossible to replace it approximately by one straight line, the month was divided into two halves, and two straight lines were adopted as the base of reduction. This method was especially made use of in such cases, however rare, where the algebraic sign of the sum of the interfering influences changed from *plus* to *minus*, or *vice versâ*, in the course of a month.

By the aid of the same curves, we are also enabled to recognize accidental changes in the instruments, as in such cases the sweep of the curve is disturbed. In order to determine the amount of such changes in scale divisions, the directions of the curves at the respective adjacent ends were employed in the usual manner.

By the methods just explained, and usually employed in similar cases, and by the absolute determinations on the magnetic horizontal force made at short intervals, it was possible to effect the reduction of the readings on the horizontal force, during the whole period of observation, to one and the same standard.

We subjoin here a complete catalogue of the corrections, by the aid of which the above tables on the horizontal force have been derived from the original readings, thus placing those more especially interested in a position to reconstruct the original records kept on the readings of the magnetometer.

Corrections applied to the Original Readings of the Instrument for Horizontal Force, in scale divisions, by which the Monthly Tables were obtained.

1858 May 1	Midn.	Red. = — 7.01.	Daily change from the 1 st to the 31 st = + 0.185.
June 1	"	" = — 1.31.	" " 1 st " 30 th = + 0.150.
July 1	"	" = + 3.20.	" " 1 st " 15 th = + 0.048.
			" " 16 th " 31 st = — 0.085.
Aug. 1	"	" = + 2.56.	" " 1 st " 31 st = — 0.072.
Sept. 1	"	" = + 0.34.	" " 1 st " 30 th = — 0.093.
Oct. 1	"	" = — 2.42.	" " 1 st " 15 th = — 0.113.
			" " 16 th " 31 st = — 0.413.
Nov. 1	"	" = — 10.73.	" " 1 st " 15 th = — 0.208.
			" " 16 th " 30 th = + 0.100.
Dec. 1	"	" = — 12.35.	" " 1 st " 15 th = + 0.180.
			" " 16 th " 31 st = — 0.241.

1859 Jan. 1	Midn.	Red. = — 13.50.	Daily change from the 1 st " 31 st = — 0.305.
Feb. 1	"	" = — 22.96.	" " 1 st " 28 th = — 0.189.
March 1	"	" = — 28.25.	" " 1 st " 15 th = — 0.147.
			" " 16 th " 31 st = — 0.061.
April 1	"	" = — 31.42.	" " 1 st " 15 th = + 0.009.
			" " 16 th " 30 th = + 0.045.
May 1	"	" = — 11.78.	" " 1 st " 31 st = + 0.275.
June 1	"	" = — 4.10.	" " 1 st " 15 th = + 0.295.
(Cor. = — 0.71.)			" " 16 th " 30 th = + 0.141.
July 1	"	" = + 3.92.	" " 1 st " 20 th = + 0.365.

Change on the 20th of July after 4^h p.m. = + 17.4.

			Daily change from the 20 th " 31 st = + 0.273.
Aug. 1	Midn.	Red. = — 10.21.	" " 1 st " 31 st = + 0.079.
Sept. 1	"	" = — 6.61.	" " 1 st " 15 th = 0.000.
			" " 16 th " 30 th = — 0.069.
Oct. 1	"	" = — 8.11.	" " 1 st " 15 th = — 0.231.
			" " 16 th " 31 st = — 0.344.
Nov. 1	"	" = — 16.63.	" " 1 st " 30 th = — 0.360.
Dec. 1	"	" = — 28.10.	" " 1 st " 15 th = — 0.173.
			" " 16 th " 31 st = — 0.445.

1860 Jan. 1	Midn.	Red. = — 35.06.	Daily change from the 1 st " 16 th = — 0.557.
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Change on the 16 of January after 9^h a.m. = — 48.3.

			Daily change from the 16 th to the 31 st = — 0.433.
Feb. 1	Midn.	Red. = — 2.04.	" " 1 st " 15 th = — 0.085.
			" " 16 th " 29 th = — 0.062.

1860 March 1	.....	Midn.	Red. = — 4·65.	Daily change from the 1 st to the 15 th = — 0·135.				
April 1	.....	"	" = — 9·98.	"	"	16 th	"	31 st = — 0·206.
May 1	.....	"	" = — 17·37.	"	"	1 st	"	15 th = — 0·307.
June 1	.....	"	" = — 23·20.	"	"	16 th	"	30 th = — 0·225.
July 1	.....	"	" = — 23·63.	"	"	1 st	"	31 st = — 0·197.
Aug. 1	.....	"	" = — 21·40.	"	"	1 st	"	15 th = — 0·021.
Sept. 1	.....	"	" = — 24·19.	"	"	16 th	"	30 th = + 0·049.
Oct. 1	.....	"	" = — 29·43.	"	"	1 st	"	31 st = + 0·072.
						1 st	"	15 th = — 0·041.
						16 th	"	31 st = — 0·136.
						1 st	"	30 th = — 0·175.
						1 st	"	19 th = — 0·203.

Change on the 19th of October after 8^h a. m. = — 43·9.

				Daily change from the 19 th to the 31 st = — 0·132.				
Nov. 1	.....	Midn.	Red. = + 6·18.	"	"	1 st	"	15 th = — 0·085.
			(Cor. = — 0·48.)	"	"	16 th	"	30 th = — 0·033.
Dec. 1	.....	Midn.	Red. = + 4·41.	"	"	1 st	"	15 th = — 0·079.
			(Cor. = — 0·53.)	"	"	16 th	"	31 st = — 0·139.
1861 Jan. 1	.....	Midn.	Red. = + 0·43.	Daily change from the 1 st	"	15 th	= — 0·300.	
Feb. 1	.....	"	" = — 4·76.	"	"	16 th	"	31 st = — 0·062.
March 1	.....	"	" = — 6·86.	"	"	1 st	"	15 th = — 0·074.
April 1	.....	"	" = — 13·59.	"	"	16 th	"	28 th = — 0·141.
May 1	.....	"	" = — 17·03.	"	"	1 st	"	31 st = — 0·210.
June 1	.....	"	" = — 19·27.	"	"	1 st	"	15 th = — 0·064.
July 1	.....	"	" = — 25·82.	"	"	16 th	"	30 th = — 0·143.
Aug. 1	.....	"	" = — 41·08.	"	"	1 st	"	31 st = — 0·097.
Sept. 1	.....	"	" = — 41·05.	"	"	1 st	"	15 th = — 0·040.
Oct. 1	.....	"	" = — 38·38.	"	"	16 th	"	30 th = — 0·397.
Nov. 1	.....	"	" = — 38·68.	"	"	1 st	"	15 th = — 0·680.
Dec. 1	.....	"	" = — 41·81.	"	"	16 th	"	31 st = — 0·316.
				"	"	1 st	"	15 th = — 0·133.
				"	"	16 th	"	31 st = + 0·127.
				"	"	1 st	"	30 th = + 0·089.
				"	"	1 st	"	15 th = + 0·013.
				"	"	16 th	"	31 st = — 0·031.
				"	"	1 st	"	15 th = — 0·033.
				"	"	16 th	"	30 th = — 0·175.
				"	"	1 st	"	15 th = — 0·193.
				"	"	16 th	"	20 th = — 0·100.
				"	"	21 st	"	31 st = — 0·022.

1862 Jan. 1	.....	Midn.	Red. = — 45·48.	Daily change from the 1 st to the 15 th = + 0·220.				
				"	"	16 th	"	31 st = + 0·469.

1862 Feb. 1 Midn. Red. = -34.67 . Daily change from the 1st to the 3rd = $+1.467$.
 " " 4th " 6th = 0.000 .

Change on the 6th of February after 2^h p.m. = $+31.0$.

Daily change from the 6th to the 14th = -0.267 .

				"	"	15 th	"	28 th	= -0.212 .
March 1		Midn.	Red. = -66.65 .	"	"	1 st	"	31 st	= -0.235 .
April 1		"	" = $+26.21$.	"	"	1 st	"	15 th	= -0.287 .
				"	"	16 th	"	30 th	= -0.510 .
May 1		"	" = $+13.60$.	"	"	1 st	"	31 st	= -0.552 .
June 1		"	" = -34.92 .	"	"	1 st	"	30 th	= -0.747 .
July 1		"	" = -57.33 .	"	"	1 st	"	7 th	= -0.500 .

Change on the 7th of July after 3^h a.m. = -37.9 .

Daily change from the 10th to the 31st = -0.077 .

Aug. 1		Midn.	Red. = -24.76 .	"	"	1 st	"	31 st	= -0.079 .
Sept. 1		"	" = -27.20 .	"	"	1 st	"	21 st	= -0.074 .

Change on the 21st of September after 5^h p.m. = -27.8 .

Daily change from the 22nd to the 30th = -0.336 .

Oct. 1		Midn.	Red. = -3.63 .	"	"	1 st	"	15 th	= $+0.163$.
				"	"	16 th	"	31 st	= $+0.416$.
Nov. 1		"	" = $+5.47$.	"	"	1 st	"	15 th	= $+0.298$.
				"	"	16 th	"	30 th	= $+0.229$.
Dec. 1		"	" = $+13.38$.	"	"	1 st	"	15 th	= $+0.060$.
				"	"	16 th	"	31 st	= -0.126 .

1863 Jan. 1 Midn. Red. = $+12.26$. Daily change from the 1st to the 15th = -0.371 .

				"	"	16 th	"	31 st	= -0.562 .
Feb. 1		"	" = -2.29 .	"	"	1 st	"	14 th	= -0.803 .
				"	"	15 th	"	28 th	= -0.361 .

14. Limit of Disturbance. It was a matter of considerable difficulty to fix upon a limit of disturbance; and in doing this I was mainly guided by the values adopted in discussing similar observations made in other localities. For this reason, 0.0012 of the horizontal force was taken for the limit of disturbance, as in the case of the "Toronto Observations" and others. All observations differing from the respective monthly means by this value or more were rejected. This value gives for the various periods in scale divisions: May, 1858, to October, 1860, 8.0; from November, 1860, to May, 1861, 6.2; from June, 1861, to June, 1862, 6.5; from July to August, 1862, 6.5; and from September, 1862, to February, 1863, 6.7. The Final Normals inserted at the foot of each table have been determined in the manner explained when speaking of the magnetic declination, and any further explanations respecting them may be dispensed with here.

15. The zero-points of the scale will be spoken of in the chapter on Absolute Horizontal Intensity, and we may therefore be permitted for the present to refrain from entering upon an examination of the same throughout the whole period of observations.

The following table contains the monthly means of the horizontal force derived from the hourly registration, and expressed in parts of the horizontal force:

MONTHLY MEANS OF THE MAGNETIC HORIZONTAL FORCE.

	Jan. ·000	Feb. ·000	Mar. ·000	April. ·000	May. ·000	June. ·000	July. ·000	Aug. ·000	Sept. ·000	Oct. ·000	Nov. ·000	Dec. ·000
1858	—	—	—	—	2·96	2·76	1·94	2·48	3·36	2·72	3·77	4·26
1859	3·81	2·80	3·07	2·47	2·70	3·49	2·63	3·20	2·64	2·91	3·80	2·19
1860	3·64	3·07	2·00	2·95	2·79	4·19	2·89	2·58	2·89	1·73	3·72	2·68
1861	4·46	3·34	5·12	3·57	4·42	1·64	5·91	5·54	3·70	3·35	2·96	4·11
1862	5·12	3·13	4·95	4·53	4·05	0·02	3·15	2·67	3·90	2·99	2·09	2·93
1863	3·07	3·98	—	—	—	—	—	—	—	—	—	—

The monthly means derived from the Final Normals (larger disturbances eliminated) are found in the next table, also expressed in parts of the horizontal force:

MONTHLY MEANS OF THE MAGNETIC HORIZONTAL FORCE.

(LARGER DISTURBANCES ELIMINATED.)

	Jan. ·000	Feb. ·000	Mar. ·000	April. ·000	May. ·000	June. ·000	July. ·000	Aug. ·000	Sept. ·000	Oct. ·000	Nov. ·000	Dec. ·000
1858	—	—	—	—	3·80	3·89	1·41	2·47	3·78	3·37	3·97	3·89
1859	3·27	3·72	3·16	4·89	2·54	3·92	3·27	4·35	4·04	5·21	4·67	3·84
1860	3·51	3·72	3·94	3·36	3·25	4·83	6·12	5·32	4·92	1·88	2·93	2·86
1861	6·41	3·94	6·43	4·75	5·46	5·72	6·14	6·71	3·59	2·87	3·33	5·15
1862	7·54	3·55	3·92	6·33	(5·40)	(0·93)	3·79	5·98	7·90	5·08	3·78	5·31
1863	1·84	3·10	—	—	—	—	—	—	—	—	—	—

16. Solar Diurnal Variation of the Magnetic Horizontal Force. In a similar manner to that followed in treating of the magnetic declination, in order to obtain the solar diurnal variation, we proceeded in the present instance. The minimum value for each month or period was subtracted from all the other values appertaining to that month or period, as the case might be.

The next series of tables contains the mean solar diurnal variation for each month throughout the time of observation, they being divided into groups, "Months from April to September," and "Months from October to March." In the case of the tables derived from all observations the variations are expressed in scale divisions of the different values; and the first column in each table shows the exact amount by which the variations have to be multiplied in order to obtain them in parts of the horizontal force. The tables comprising the results from the final normals have been reduced to ten-thousandths of the horizontal force. The values for months to which an asterisk is attached have been interpolated, and are not the result of actual observation.

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC HORIZONTAL FORCE. ALL OBSERVATIONS.
(MONTHS FROM APRIL TO SEPTEMBER.)

MONTHS.	Val. of a sc. div.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
	0.000												
1858 May	1.49	3.68	4.02	4.20	4.47	4.88	4.78	5.02	5.58	5.73	5.05	3.72	2.43
„ June	„	2.37	2.49	2.85	3.28	4.02	4.12	3.91	3.99	5.29	5.21	4.62	2.89
„ July	„	1.36	1.52	2.05	1.99	2.49	2.88	3.48	3.62	4.57	4.47	4.15	3.33
„ August	„	4.47	4.29	4.96	5.23	5.48	5.63	6.65	7.47	8.00	7.58	6.16	3.75
„ September	„	8.23	8.56	8.37	8.43	9.29	9.00	9.63	9.72	9.20	5.89	3.36	1.08
1859 April	„	5.93	6.24	6.86	5.91	6.17	5.62	6.19	5.78	4.69	2.32	0.00	0.13
„ May	„	3.30	3.05	3.54	3.35	3.16	3.29	3.34	4.39	4.81	4.14	4.31	3.64
„ June	„	2.01	2.17	1.47	1.62	2.15	2.54	2.61	3.69	3.45	3.42	2.84	2.03
„ July	„	0.26	0.83	0.00	0.15	1.06	1.98	2.20	1.80	2.28	2.84	3.34	3.14
„ August	„	0.17	0.04	0.99	1.15	2.09	2.33	2.96	3.93	3.57	2.07	2.65	0.89
„ September	„	3.66	1.05	1.85	2.66	2.24	2.97	3.81	2.19	3.85	3.83	3.02	0.92
1860 April	„	7.70	8.12	7.31	8.01	7.42	7.92	8.11	7.97	7.08	4.27	2.33	0.75
„ May	„	6.10	6.19	6.41	6.94	7.52	7.77	7.82	8.15	8.39	7.87	6.37	3.87
„ June	„	4.42	4.42	4.59	5.27	5.45	5.50	5.86	6.38	7.04	7.22	5.51	3.30
„ July	„	4.62	5.00	5.23	5.88	6.13	6.32	7.21	8.88	8.66	8.67	6.90	3.48
„ August	„	6.28	3.76	5.46	3.74	4.36	2.86	4.34	5.96	7.03	5.33	4.90	3.95
„ September	„	7.43	8.13	7.12	7.78	7.80	8.83	9.21	8.20	7.99	6.64	4.22	1.31
1861 April	1.93	4.82	4.68	4.43	4.41	5.00	4.64	5.06	3.75	3.40	2.49	1.57	0.64
„ May	„	1.61	0.90	0.95	0.92	1.05	1.62	1.70	1.67	1.65	1.65	2.09	0.53
„ June	1.84	4.22	4.91	5.08	5.57	5.97	7.55	7.42	7.08	6.97	6.42	5.40	3.21
„ July	„	5.71	5.86	6.13	6.25	6.18	6.82	7.08	7.44	8.18	8.13	6.22	3.93
„ August	„	4.68	4.22	5.26	5.71	6.26	6.38	6.90	7.75	8.70	8.24	6.59	4.15
„ September	„	8.42	9.57	8.78	9.03	9.76	9.71	10.53	10.61	10.87	8.22	5.85	2.77
1862 April	„	7.15	7.57	7.74	7.45	8.73	8.34	8.59	7.58	7.29	5.54	2.37	0.35
„ May	„	0.00	1.41	2.10	4.04	4.95	4.02	4.81	5.18	7.61	5.52	3.98	3.92
„ June	„	4.38	2.34	2.36	2.96	4.20	3.42	3.65	6.01	5.55	2.54	3.36	2.97
„ July	„	4.21	3.90	6.82	4.66	4.69	5.19	5.49	3.90	4.85	3.85	2.80	1.53
„ August	„	5.95	5.84	5.69	6.42	6.76	6.90	7.61	7.84	7.98	7.67	4.69	1.80
„ September	„	5.82	6.80	5.76	6.06	6.68	7.38	7.19	6.80	5.79	4.44	2.24	1.20

MONTHS.	Val. of a sc. div.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
	0.000												
1858 May	1.49	1.67	0.73	0.00	0.73	1.53	1.44	2.89	3.37	3.67	3.03	3.22	3.74
„ June	„	3.69	1.82	0.95	1.42	1.25	2.65	2.69	1.18	0.00	0.22	0.88	2.19
„ July	„	2.17	1.10	0.00	1.07	1.97	1.67	1.76	0.92	0.72	1.27	0.73	0.64
„ August	„	2.04	0.97	0.00	1.15	3.12	3.52	3.04	3.20	3.07	2.71	2.99	3.29
„ September	„	0.00	0.29	1.82	3.52	4.48	5.58	5.92	6.27	5.88	7.00	7.39	8.11
1859 April	„	0.13	1.46	2.34	3.42	4.15	4.48	4.28	4.32	5.08	4.44	4.89	5.73
„ May	„	1.29	0.65	0.00	1.35	3.01	3.28	3.39	2.86	2.69	2.85	4.09	3.01
„ June	„	1.68	0.68	0.00	1.02	2.45	2.32	2.87	3.42	2.41	1.97	1.61	1.79
„ July	„	2.27	1.92	1.07	2.10	3.04	3.77	3.50	0.90	1.07	1.20	0.44	0.84
„ August	„	0.12	0.09	0.98	0.00	3.64	3.33	3.09	3.57	0.62	1.77	1.09	2.06
„ September	„	0.00	1.18	4.21	5.86	6.43	5.42	4.83	3.19	3.60	4.24	6.16	2.55
1860 April	„	0.10	0.00	0.89	2.51	3.65	4.69	6.06	6.21	6.84	6.81	6.21	6.62
„ May	„	1.58	0.00	0.86	2.12	3.26	3.91	5.59	5.85	5.98	6.20	5.68	6.28
„ June	„	1.12	0.22	0.00	0.55	2.65	3.21	2.99	2.96	3.15	3.04	3.20	3.40
„ July	„	1.44	0.00	1.11	3.42	5.38	5.40	5.58	5.33	5.33	4.11	4.24	4.79
„ August	„	1.97	0.82	0.00	0.65	3.11	3.55	3.89	5.08	3.85	5.09	3.45	4.24
„ September	„	0.00	0.14	0.71	3.04	3.40	4.53	4.19	5.25	6.52	5.97	7.83	6.27
1861 April	1.93	0.00	0.83	2.17	2.94	3.75	3.62	4.22	4.37	4.21	4.10	4.28	4.43
„ May	„	0.39	0.05	0.00	0.34	1.13	1.69	1.72	0.94	0.35	0.64	0.94	0.82
„ June	1.84	1.72	0.36	0.00	1.23	3.03	4.05	3.82	4.19	3.83	3.98	4.25	5.00
„ July	„	1.91	0.58	0.00	2.16	3.09	3.77	4.67	4.97	4.66	5.12	5.11	5.22
„ August	„	2.05	0.71	0.12	0.00	0.74	2.75	3.23	3.21	3.72	3.93	4.29	4.11
„ September	„	0.86	0.00	0.75	1.50	3.22	4.50	5.33	5.37	6.08	7.28	7.72	7.55
1862 April	„	0.00	0.27	1.55	2.49	2.15	1.53	2.63	4.42	5.27	4.26	4.05	4.12
„ May	„	3.69	5.91	6.05	4.27	6.97	2.71	3.34	3.77	2.96	1.65	1.97	2.62
„ June	„	4.12	5.84	0.00	2.71	0.29	3.30	3.89	4.26	4.75	5.29	5.47	5.11
„ July	„	0.16	0.36	0.81	0.76	0.91	0.51	0.33	0.00	0.29	1.58	2.23	2.77
„ August	„	0.43	0.00	0.38	1.42	2.26	3.21	3.40	3.94	3.75	4.08	4.77	5.57
„ September	„	0.06	0.00	1.72	2.45	3.41	4.01	4.13	3.43	4.54	4.68	4.25	4.77

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC HORIZONTAL FORCE. ALL OBSERVATIONS.
(MONTHS OCTOBER TO MARCH.)

MONTHS.	Val. of a sc. div.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ..	0.000	8.33	8.40	8.80	9.68	9.68	10.11	10.39	9.30	7.30	3.62	0.72	0.00
.. November ..	1.49	7.41	7.87	8.51	8.37	8.47	8.93	8.73	7.62	4.43	1.60	0.00	0.32
.. December ..	"	8.04	8.83	8.97	9.01	9.69	9.82	9.49	8.26	5.46	2.42	0.03	0.00
1859 January ..	"	9.46	9.81	10.07	10.66	10.72	10.85	11.20	10.48	7.65	3.31	1.27	0.19
.. February ..	"	10.97	10.74	10.62	11.51	11.77	12.82	12.65	11.60	8.81	4.87	1.90	0.00
.. March ..	"	9.13	9.64	9.43	8.86	9.79	10.14	10.01	9.63	7.69	4.11	0.81	0.00
.. October ..	"	8.22	8.15	7.15	7.43	9.18	8.10	8.99	8.23	6.14	4.27	1.08	0.00
.. November ..	"	9.59	8.52	8.26	8.14	8.89	9.43	9.52	8.14	5.84	2.67	0.77	0.00
.. December ..	"	7.95	8.22	8.06	8.41	8.50	9.15	8.38	6.79	3.99	0.82	0.00	0.05
1860 January ..	"	8.80	8.60	8.64	8.43	8.55	8.56	8.98	7.74	6.32	3.03	2.28	0.00
.. February ..	"	9.70	9.72	10.12	9.66	9.46	10.16	9.68	8.93	6.45	3.51	1.92	0.00
.. March ..	"	8.19	7.76	9.12	9.39	10.12	9.92	10.11	8.27	6.55	4.11	0.97	0.00
.. October ..	"	6.95	7.07	7.46	8.19	8.75	8.64	9.01	8.53	7.74	4.19	1.29	0.00
.. November ..	1.93	5.86	5.46	5.46	5.67	6.15	6.34	6.61	5.87	4.03	2.72	0.27	0.00
.. December ..	"	5.62	5.30	5.16	5.28	5.22	5.22	5.79	5.11	3.37	1.50	1.06	0.00
1861 January ..	"	6.67	6.90	6.23	6.99	6.44	6.98	6.21	4.89	3.78	2.43	0.55	0.00
.. February ..	"	5.30	5.53	5.70	5.53	5.96	5.77	5.44	5.17	4.16	3.16	1.24	0.02
.. March ..	"	7.83	7.16	7.26	7.71	7.68	8.02	7.79	7.35	5.91	3.69	1.38	0.00
.. October ..	1.84	8.74	9.26	9.52	9.74	10.09	10.22	10.66	10.20	8.59	5.87	2.78	0.54
.. November ..	"	8.57	9.09	9.78	9.73	9.95	10.08	9.88	8.91	6.61	3.12	0.65	0.00
.. December ..	"	8.84	9.52	9.38	9.00	8.91	9.35	9.03	6.91	4.62	1.91	0.00	0.23
1862 January ..	"	10.41	10.49	10.21	9.36	10.01	10.19	10.25	8.47	6.42	3.26	0.57	0.00
.. February ..	"	8.68	8.67	8.55	8.65	8.66	8.56	8.56	8.58	7.61	4.88	1.81	0.59
.. March ..	"	8.18	7.89	8.05	8.25	8.46	8.42	8.56	8.01	6.45	3.59	0.88	0.00
.. October ..	1.80	8.05	7.71	7.53	9.20	9.60	8.29	9.54	6.85	5.82	3.55	0.73	0.00
.. November ..	"	8.05	8.97	8.50	7.79	8.42	8.55	8.59	8.15	6.33	2.93	0.62	0.00
.. December ..	"	8.26	8.72	9.88	9.19	9.32	9.96	9.53	8.46	7.11	3.39	1.18	0.00
1863 January ..	"	9.25	9.02	9.27	9.09	8.25	8.95	8.20	7.00	5.58	2.94	1.17	0.11
.. February ..	"	9.24	9.84	9.34	10.14	9.60	9.98	9.91	8.89	7.07	3.88	1.15	0.00

MONTHS.	Val. of a sc. div.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ..	0.000	1.75	3.85	7.03	8.16	7.56	7.75	6.79	6.76	8.23	7.62	7.34	7.35
.. November ..	1.49	3.63	7.08	9.42	10.83	10.06	9.08	8.63	7.76	7.44	7.75	8.04	8.07
.. December ..	"	2.19	4.69	6.83	8.02	8.43	8.01	8.39	7.87	8.11	9.05	8.91	8.71
1859 January ..	"	0.00	4.20	6.72	9.55	10.95	11.41	10.47	9.72	10.16	10.46	9.99	9.84
.. February ..	"	1.68	4.16	5.96	8.46	10.20	10.30	10.71	11.27	11.58	11.31	11.27	11.15
.. March ..	"	0.79	2.79	3.82	6.41	6.69	6.34	7.04	7.65	8.57	8.58	8.87	9.61
.. October ..	"	0.74	4.22	5.60	7.93	9.27	8.91	8.84	8.54	9.25	10.29	8.23	8.82
.. November ..	"	2.39	5.42	7.44	9.25	9.64	9.41	8.75	9.01	8.99	9.02	9.35	8.87
.. December ..	"	2.48	5.82	9.10	10.96	10.61	10.25	10.80	9.75	10.35	9.99	9.19	7.60
1860 January ..	"	2.13	4.48	6.76	9.66	10.13	10.01	9.31	8.84	9.48	10.02	9.78	8.71
.. February ..	"	1.60	3.85	5.98	8.94	10.38	10.30	10.58	10.63	10.53	10.45	10.69	9.78
.. March ..	"	0.17	2.34	4.96	7.28	7.92	7.21	8.04	9.60	7.86	9.15	8.41	9.10
.. October ..	"	0.60	2.79	4.96	6.97	6.95	6.92	7.22	7.34	7.09	7.04	7.28	7.30
.. November ..	1.93	0.91	2.72	4.61	6.34	6.52	6.15	4.96	4.58	5.02	5.50	5.77	5.59
.. December ..	"	1.88	4.14	5.39	6.42	6.39	5.97	5.15	5.42	5.37	5.28	5.25	5.19
1861 January ..	"	0.44	2.34	4.02	5.56	6.95	6.92	6.80	6.26	6.74	6.12	7.12	6.81
.. February ..	"	0.00	1.37	2.55	4.03	4.96	5.80	5.50	5.47	5.92	5.22	4.96	5.19
.. March ..	"	0.46	2.00	4.63	6.28	6.80	6.54	6.53	7.10	7.44	7.45	7.80	7.68
.. October ..	1.84	0.00	0.95	2.51	4.67	5.34	6.15	7.36	7.82	7.76	7.98	9.09	8.22
.. November ..	"	1.20	3.08	5.10	6.70	7.29	7.54	6.92	7.95	8.19	7.51	8.16	8.52
.. December ..	"	1.21	2.93	5.51	7.23	8.30	8.03	8.40	7.82	8.52	9.20	9.64	8.63
1862 January ..	"	1.77	3.66	5.67	6.47	8.28	9.05	7.49	9.27	9.80	10.31	10.19	10.45
.. February ..	"	0.00	1.09	3.13	5.69	6.51	7.10	7.69	7.61	7.91	8.27	8.07	8.15
.. March ..	"	0.62	1.70	3.81	5.53	6.33	6.52	5.95	6.62	6.38	6.63	7.20	7.68
.. October ..	1.80	0.41	1.65	2.58	3.08	2.84	3.83	4.37	5.51	5.51	5.99	6.78	8.00
.. November ..	"	0.67	2.69	4.23	4.92	5.74	5.73	6.07	5.78	6.50	6.97	7.59	7.82
.. December ..	"	1.61	2.34	5.19	6.52	6.68	6.26	6.01	5.61	6.51	7.49	7.45	7.83
1863 January ..	"	0.00	1.75	3.70	4.03	5.22	5.79	5.59	4.98	5.81	6.81	7.06	6.72
.. February ..	"	0.73	2.08	3.57	4.56	6.07	7.04	6.81	7.80	8.66	8.09	8.45	9.22

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC HORIZONTAL FORCE.
LARGER DISTURBANCES ELIMINATED.

(MONTHS APRIL TO SEPTEMBER.)

One part equal to 0.0001 of the Horizontal Force.

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 April*	10.34	11.17	9.85	10.42	11.09	11.13	11.13	11.21	9.78	6.35	3.04	0.00
„ May	4.91	5.41	4.77	5.17	5.32	5.62	5.97	6.79	7.23	6.49	5.88	3.08
„ June	2.14	2.34	2.98	3.42	4.09	4.70	4.99	5.11	7.49	7.68	6.34	4.39
„ July	1.05	0.88	1.62	1.55	2.70	3.27	4.15	4.74	6.45	6.48	5.12	3.93
„ August	5.69	5.83	6.81	7.20	7.56	7.78	9.27	10.47	11.24	10.63	8.06	5.03
„ September	11.59	11.67	11.80	11.88	13.14	13.13	14.08	14.73	13.58	10.16	5.68	1.75
1859 April	7.97	9.20	8.60	8.36	7.95	8.47	10.12	9.01	7.66	4.03	1.87	0.00
„ May	4.56	5.06	5.11	5.87	5.21	5.96	6.14	7.17	7.74	7.34	6.27	5.29
„ June	4.00	4.19	2.72	2.85	4.58	3.75	3.90	5.32	4.58	5.21	3.66	2.89
„ July	1.03	1.75	1.34	0.00	1.35	1.69	3.08	2.58	3.28	5.46	5.14	4.10
„ August	1.47	0.00	1.06	1.23	2.51	2.96	4.31	6.09	5.56	5.80	6.13	4.48
„ September	6.31	1.85	2.57	5.35	3.94	8.60	8.66	2.91	6.08	8.35	6.72	0.00
1860 April	11.05	11.23	10.04	11.52	10.98	11.45	11.75	11.59	10.50	6.26	3.46	0.00
„ May	8.89	9.91	8.82	9.58	10.99	10.80	11.39	11.36	12.21	10.95	9.15	5.85
„ June	6.45	6.45	7.11	7.69	7.95	8.03	8.56	9.32	10.28	10.96	8.48	4.82
„ July	8.57	8.48	9.33	9.61	10.40	9.37	10.04	11.45	11.45	11.94	10.69	5.41
„ August	9.58	9.20	10.44	9.37	9.67	9.71	10.06	12.27	12.80	11.86	9.01	6.76
„ September	10.75	10.99	11.05	11.67	11.80	12.53	13.10	12.83	11.90	9.21	5.84	1.29
1861 April	8.64	8.55	8.05	8.26	9.19	9.03	9.40	7.57	7.29	5.38	3.57	1.68
„ May	2.59	2.32	2.91	3.30	3.09	3.17	4.37	3.98	5.40	4.03	3.51	1.69
„ June	8.19	8.52	7.78	8.30	9.27	11.19	10.18	11.48	9.75	10.32	8.34	5.06
„ July	10.89	10.75	11.24	11.47	11.85	12.51	12.99	13.66	15.75	14.92	11.87	7.62
„ August	10.62	10.91	10.60	12.03	12.31	12.79	13.82	15.44	16.60	15.84	12.90	9.31
„ September	15.29	17.45	15.99	16.97	18.31	17.81	19.14	19.84	20.78	15.03	10.09	4.93
1862 April	11.37	11.96	11.52	11.21	11.26	13.87	13.50	12.71	13.12	9.64	4.27	2.34
„ May*	7.36	7.37	7.60	8.15	8.54	10.64	10.13	10.08	10.99	9.37	5.48	4.15
„ June*	8.71	8.49	8.35	8.67	9.87	12.15	10.87	11.78	11.23	11.42	6.49	4.62
„ July	9.29	8.50	9.24	9.59	10.78	12.23	11.87	11.65	11.19	10.80	6.85	4.25
„ August	9.88	9.92	10.36	11.65	11.30	12.27	13.75	14.44	14.55	13.05	8.80	4.34
„ September	11.37	11.43	11.82	12.55	12.95	14.48	15.07	15.11	12.37	9.37	5.39	3.96

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 April*	0.99	2.58	4.25	4.28	5.31	6.95	7.79	8.52	8.97	8.01	8.63	9.54
„ May	1.84	1.17	0.00	1.42	2.82	3.40	4.10	4.56	4.00	4.04	4.25	4.99
„ June	3.31	2.64	0.82	0.88	2.98	4.03	3.68	1.61	0.53	0.28	0.00	1.42
„ July	2.23	1.09	0.23	0.62	2.49	2.46	2.07	0.41	0.12	0.92	0.13	0.00
„ August	2.54	0.98	0.00	1.24	4.12	4.70	4.00	4.23	4.45	3.51	3.93	4.37
„ September	0.04	0.00	2.72	4.71	6.48	8.15	8.16	9.46	9.41	10.25	10.29	11.34
1859 April	0.29	2.92	5.03	5.72	6.14	6.37	6.55	7.48	8.53	6.55	8.45	7.83
„ May	2.54	1.56	0.00	1.94	4.29	4.68	5.00	4.73	4.51	5.20	6.29	4.45
„ June	1.97	0.03	0.00	2.22	5.52	4.79	6.41	4.77	4.10	3.87	2.38	2.54
„ July	3.25	1.76	0.12	3.48	4.53	5.43	4.71	3.18	2.51	2.55	1.38	1.72
„ August	1.36	1.96	2.52	3.94	6.13	6.07	7.11	5.15	1.91	4.08	2.52	1.32
„ September	2.34	3.63	7.34	9.94	11.42	8.82	7.43	8.36	5.58	8.79	11.25	2.66
1860 April	0.64	1.15	1.76	2.03	4.82	7.65	9.37	9.59	9.93	9.30	8.44	9.04
„ May	2.32	0.00	0.79	3.02	4.91	5.77	7.62	8.00	8.70	10.05	8.73	9.55
„ June	1.64	0.32	0.00	1.90	4.34	6.28	6.16	6.20	6.43	6.90	6.25	6.43
„ July	0.77	0.00	1.53	5.38	7.94	8.42	8.06	8.75	8.60	7.86	7.74	8.36
„ August	3.89	0.68	0.00	2.96	5.66	7.14	7.40	9.29	8.30	7.34	8.39	8.03
„ September	0.59	0.00	2.85	4.86	6.57	8.33	8.54	10.04	9.76	10.42	10.81	10.31
1861 April	0.00	1.37	3.69	6.62	7.74	7.89	9.26	8.76	9.09	8.13	8.44	7.99
„ May	0.23	0.00	0.51	1.08	2.87	3.45	4.42	2.87	1.16	2.18	1.30	1.13
„ June	0.00	0.13	0.26	2.23	5.37	7.05	7.73	6.55	5.41	6.37	6.98	9.46
„ July	3.48	1.03	0.00	3.22	6.14	8.14	8.55	9.11	9.02	9.38	9.96	10.76
„ August	4.85	2.32	0.00	0.43	1.75	6.57	6.75	7.51	8.87	9.03	10.19	9.11
„ September	1.29	0.00	1.27	4.30	6.83	8.35	10.16	10.60	12.40	14.17	13.91	14.66
1862 April	0.00	3.13	4.23	5.39	4.84	4.93	8.16	8.39	9.37	10.39	9.59	9.03
„ May*	0.00	0.85	1.67	1.76	2.77	2.16	5.65	4.65	4.33	7.12	6.98	6.59
„ June*	0.00	0.98	1.82	2.36	4.32	4.06	9.17	5.78	5.34	7.51	7.23	8.18
„ July	0.00	0.85	2.87	3.51	5.67	5.35	7.86	6.71	6.18	7.40	8.87	9.90
„ August	0.43	0.00	1.07	2.71	4.23	6.07	6.53	6.98	6.88	7.73	9.96	9.92
„ September	0.00	2.69	5.32	6.06	7.25	8.04	9.00	6.98	8.82	10.37	9.53	10.12

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC HORIZONTAL FORCE.
LARGER DISTURBANCES ELIMINATED.

(MONTHS OCTOBER TO MARCH.)

One part equal to 0.0001 of the Horizontal Force.

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 March*	15.32	15.37	15.59	15.57	16.98	17.02	16.01	15.41	12.23	7.16	2.23	0.00
" October	11.59	11.72	11.69	13.68	13.68	14.75	14.29	13.08	10.31	4.31	1.43	0.00
" November	10.84	12.03	12.42	12.22	12.36	13.04	12.74	11.59	7.08	3.71	0.07	0.00
" December	15.16	15.77	15.48	15.60	16.35	16.76	15.84	14.83	10.79	6.07	1.12	0.00
1859 January	12.30	11.11	12.48	13.21	13.23	13.10	13.50	12.29	9.18	3.93	0.67	0.00
" February	17.03	17.88	16.70	16.12	16.50	17.82	18.57	17.33	13.65	7.83	2.08	0.00
" March	13.33	14.00	13.76	12.94	14.29	14.80	14.61	14.06	11.65	6.00	1.18	0.00
" October	14.05	13.18	11.45	12.88	14.53	12.70	14.19	11.40	10.90	4.83	1.11	0.00
" November	12.62	11.05	12.69	12.09	11.61	12.88	12.98	12.26	8.00	4.38	1.05	0.00
" December	12.06	12.44	12.62	13.13	11.30	12.44	12.24	10.29	5.99	2.70	0.00	0.50
1860 January	12.63	11.40	12.39	12.09	12.26	12.27	12.48	11.08	8.12	2.79	3.02	0.00
" February	13.52	13.08	14.11	13.90	14.19	14.19	13.49	12.91	9.52	6.57	3.40	0.00
" March	13.20	12.80	13.30	14.59	15.51	14.75	14.42	11.64	9.43	5.65	0.88	0.00
" October	11.68	12.18	11.65	13.15	13.49	13.96	13.91	13.21	11.62	6.87	2.64	0.00
" November	8.46	7.87	7.87	8.18	8.83	9.15	9.55	8.47	5.78	3.43	0.29	0.00
" December	9.53	8.67	8.88	9.14	9.12	9.85	10.10	8.83	6.98	3.75	2.76	0.00
1861 January	10.57	9.55	9.80	9.92	8.70	9.94	10.40	8.15	5.71	2.55	0.53	0.00
" February	10.14	10.59	10.93	10.65	12.07	11.14	10.91	9.40	8.59	5.48	1.82	0.00
" March	14.40	13.10	15.19	14.38	14.30	15.40	15.19	13.39	10.04	4.75	2.74	0.00
" October	14.48	15.95	16.28	15.93	16.21	17.06	18.07	17.28	15.33	10.32	5.10	0.02
" November	15.66	17.57	17.87	17.96	18.81	18.12	18.38	16.54	13.62	5.35	0.66	0.00
" December	17.00	17.24	17.83	16.19	16.08	17.18	18.07	13.42	9.09	3.28	0.00	0.39
1862 January	21.16	19.76	19.39	17.68	18.31	20.13	19.78	17.68	10.82	5.61	1.46	0.00
" February	16.89	17.37	17.10	17.36	17.96	17.26	17.96	17.65	14.23	9.31	2.98	0.00
" March	15.11	14.87	15.95	14.23	15.40	13.95	14.59	13.31	10.76	7.56	2.43	0.00
" October	17.06	16.69	15.95	17.89	17.62	17.39	18.05	15.80	7.20	7.58	3.37	0.00
" November	13.03	13.37	17.69	17.19	16.69	14.72	17.01	12.98	11.21	5.49	0.00	1.19
" December	14.24	16.72	17.69	15.37	16.54	18.61	17.69	14.72	13.10	6.68	2.03	0.00
1863 January	16.27	13.97	17.53	15.12	14.51	13.28	13.73	11.92	9.18	7.13	5.47	0.00
" February	15.73	17.03	17.01	18.05	17.35	17.26	18.13	16.36	12.80	6.44	1.06	0.47

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 March*	2.43	5.48	8.73	10.39	10.46	11.21	11.21	13.71	13.77	13.96	14.63	15.70
" October	2.07	5.49	9.29	10.93	10.75	10.37	10.12	10.58	11.71	11.46	11.11	11.11
" November	4.88	9.87	13.85	16.28	14.75	13.26	12.60	11.33	11.75	11.87	12.66	12.27
" December	3.87	6.87	11.80	12.12	12.51	12.91	12.96	12.62	12.89	14.88	14.54	14.37
1859 January	0.68	3.89	9.15	13.85	14.84	14.96	14.02	11.74	12.85	13.26	12.82	12.45
" February	1.94	5.84	9.20	13.14	14.80	14.96	15.01	16.73	17.04	18.02	17.15	15.86
" March	1.15	4.48	5.99	9.35	10.22	9.81	10.23	11.56	12.92	12.53	12.95	13.17
" October	0.73	4.25	7.24	11.83	13.50	11.62	11.81	11.39	12.62	13.18	13.23	13.61
" November	2.95	7.18	10.86	13.99	13.65	12.88	11.52	12.41	12.42	12.50	12.42	12.19
" December	3.07	6.86	11.67	15.51	14.34	13.36	13.70	12.21	13.16	13.93	13.53	11.46
1860 January	2.89	6.75	9.65	13.71	14.57	14.85	13.38	12.69	13.62	13.78	14.06	13.04
" February	2.89	6.67	9.01	12.41	15.22	15.52	15.48	14.88	15.46	15.68	14.96	15.04
" March	1.23	4.47	8.09	10.29	10.47	11.14	12.33	15.43	13.97	15.11	14.22	14.44
" October	1.64	4.42	8.00	10.94	10.84	11.33	11.30	10.95	14.52	11.04	11.39	12.85
" November	1.94	4.35	7.52	9.56	9.41	8.88	7.14	7.01	7.23	7.92	8.32	8.06
" December	3.08	6.34	9.56	10.51	11.37	9.50	8.64	10.86	9.87	9.35	9.15	9.12
1861 January	0.33	4.05	5.65	9.11	10.52	11.95	12.11	9.63	9.42	9.96	10.48	9.59
" February	0.35	2.59	4.82	6.73	9.00	11.60	11.52	12.14	11.54	10.18	9.50	9.55
" March	1.18	3.49	8.15	11.37	11.77	12.05	11.14	12.74	13.36	12.49	14.28	14.07
" October	0.11	0.00	3.28	5.87	8.69	9.61	11.19	11.76	12.55	13.31	14.48	14.83
" November	3.24	6.69	9.18	13.82	14.34	14.17	12.62	15.25	15.03	12.88	16.10	16.07
" December	2.91	5.87	9.42	12.77	14.85	15.42	16.50	14.52	15.68	17.04	17.34	15.99
1862 January	2.01	5.08	10.16	10.19	12.82	15.81	15.68	16.03	19.91	20.33	19.23	19.69
" February	1.38	1.80	7.03	12.16	15.09	15.48	16.16	15.99	16.43	17.28	16.25	16.36
" March	1.62	3.24	7.47	10.91	13.62	14.17	12.09	13.25	12.09	13.32	13.69	13.73
" October	1.67	3.96	5.87	6.59	9.13	12.02	12.76	14.22	13.00	14.49	14.08	15.66
" November	1.19	2.77	5.56	7.31	9.67	11.43	9.04	7.58	10.24	10.49	11.92	14.22
" December	2.56	3.91	7.16	9.77	9.95	10.33	10.37	5.17	9.65	12.74	14.58	12.38
1863 January	0.99	3.78	6.14	9.02	7.85	7.83	6.79	6.48	8.01	11.56	11.70	11.18
" February	0.00	3.24	5.60	8.77	11.54	12.71	12.89	14.38	14.20	14.80	15.01	15.23

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The values of these tables have been combined into general means for the whole period of observation, in order to obtain Solar Diurnal Variation Tables, for every month, for the months from April to September and from October to March, and for the year. The mean values thus obtained have been again referred to the minimum in each of the respective periods to which they belong, whereby the minimum is made to be zero, and the values for the other hours are simply the differences with respect to the minimum.

MEAN SOLAR DIURNAL VARIATIONS IN THE MAGNETIC HORIZONTAL FORCE.

(DERIVED FROM ALL OBSERVATIONS.)

One part = 0.0001 of the Horizontal Force.

HOUR.	DURING THE YEARS 1858 TO 1863.														
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Summer.	Winter.	Year.
Midnight.	15.08	14.50	13.99	10.61	2.04	4.31	4.56	6.71	10.61	12.92	13.29	13.06	13.80	5.55	8.59
1 ^h	15.12	14.73	13.57	11.01	2.34	5.09	4.83	5.65	10.92	13.02	13.47	13.67	13.94	5.71	8.74
2 ^h	14.98	14.66	14.13	10.89	2.87	5.11	5.99	6.97	10.13	12.99	13.66	13.97	14.07	6.08	8.99
3 ^h	15.00	15.05	14.31	10.66	3.76	5.89	5.45	7.02	10.79	14.24	13.39	13.75	14.29	6.36	9.24
4 ^h	14.78	15.04	15.01	11.41	4.38	6.92	5.93	7.89	11.42	15.20	14.14	13.97	14.68	7.09	9.80
5 ^h	15.35	15.59	15.21	11.04	4.35	7.38	6.80	7.65	12.09	14.54	14.61	14.59	14.98	7.34	10.07
6 ^h	15.04	14.44	15.19	11.64	4.77	7.48	7.52	9.04	12.87	15.62	14.62	14.21	14.85	8.01	10.34
7 ^h	13.25	14.24	13.91	10.34	5.47	8.73	7.49	10.45	12.00	13.80	13.07	11.94	13.36	8.25	9.72
8 ^h	9.89	11.27	11.14	9.30	6.60	9.03	8.47	11.22	12.01	11.37	9.23	8.28	10.17	8.66	8.33
9 ^h	4.99	6.68	6.49	6.12	5.27	7.74	8.22	9.86	9.16	6.84	4.42	3.37	5.43	7.00	5.13
10 ^h	1.80	2.47	1.73	2.63	4.08	6.81	6.66	7.78	5.78	2.01	0.70	0.74	1.57	4.94	2.17
11 ^h	0.00	0.00	0.00	0.72	2.13	4.44	4.03	4.29	2.10	0.00	0.00	0.00	0.00	2.25	0.04
Noon.	1.36	1.01	0.86	0.00	0.38	3.80	1.56	1.68	0.00	0.87	2.73	3.04	1.68	0.50	0.00
1 ^h	5.37	3.83	3.66	0.99	0.13	2.81	0.30	0.36	0.14	3.98	6.78	6.55	5.08	0.00	1.45
2 ^h	8.89	6.75	7.26	2.88	0.00	0.00	0.00	0.00	2.56	6.89	10.10	10.62	8.46	0.06	3.18
3 ^h	11.60	10.25	10.67	4.69	0.48	2.06	2.09	0.60	4.80	9.50	12.57	13.04	11.30	1.59	5.36
4 ^h	13.79	12.40	11.63	5.62	2.84	2.83	3.62	3.59	6.34	9.87	13.03	13.50	12.40	3.31	6.77
5 ^h	14.37	13.29	11.20	5.79	1.74	4.86	3.86	4.83	7.39	10.47	12.62	12.86	12.52	3.93	7.14
6 ^h	13.19	13.52	11.50	7.02	2.95	5.11	4.12	4.97	7.56	11.49	11.73	12.86	12.42	4.45	7.35
7 ^h	13.05	14.02	12.89	7.98	2.87	5.08	3.01	5.70	7.25	12.00	11.67	12.14	12.63	4.44	7.44
8 ^h	14.05	14.67	12.64	8.82	2.42	4.53	2.99	4.53	8.30	11.96	12.09	12.95	13.08	4.36	7.64
9 ^h	14.61	14.22	13.25	8.05	1.98	4.69	3.48	5.34	9.15	12.33	12.29	13.69	13.41	4.58	7.91
10 ^h	14.83	14.24	13.51	7.95	2.48	4.99	3.36	5.12	10.40	12.39	13.04	13.55	13.60	4.86	8.15
11 ^h	14.32	14.33	14.21	8.55	2.68	5.64	3.86	5.96	9.20	12.70	13.06	12.76	13.55	5.11	8.24
Means	11.446	11.300	10.748	7.280	2.875	5.222	4.508	5.717	8.040	10.291	10.680	10.796	10.886	4.768	6.741

The general means for every month, semi-annual period, and the year, inserted at the bottom of this table, are useful for the purpose of reducing observations on the magnetic horizontal force to the mean of the day on which they were made. This can, of course, only give an approximate result, as the day of observation may be a disturbed one, and the mean solar diurnal variation varies within the eleven years' period; but it is, however, of great importance

for the reduction of observations, made subsequent to the 28th of February, 1863, when hourly observations on the magnetic elements were discontinued.

The next table gives also the mean solar diurnal variation, but the larger disturbances are in this case eliminated. On plate 24 we have the results thrown into curves.

MEAN SOLAR DIURNAL VARIATIONS IN THE MAGNETIC HORIZONTAL FORCE.

(LARGER DISTURBANCES ELIMINATED.)

One part = 0·0001 of the Horizontal Force.

HOUR.	DURING THE YEARS 1858 TO 1863.														
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Summer.	Winter.	Year.
Midnight.	14·59	14·57	14·27	9·49	4·97	5·32	5·22	6·73	10·21	13·77	11·88	13·42	13·75	6·47	9·09
1 ^h	13·16	15·10	14·03	10·04	5·42	5·42	5·12	6·45	9·83	13·94	12·14	13·99	13·73	6·52	9·10
2 ^h	14·32	15·08	14·76	9·23	5·25	5·21	5·60	7·13	9·80	13·40	13·47	14·32	14·22	6·52	9·35
3 ^h	13·60	15·13	14·34	9·57	5·82	5·61	5·49	7·58	10·83	14·71	13·29	13·71	14·13	6·96	9·52
4 ^h	13·40	15·52	15·29	9·51	6·04	6·57	6·47	7·95	11·18	15·11	13·43	13·70	14·41	7·43	9·90
5 ^h	13·74	15·44	15·18	10·41	6·65	7·38	6·86	8·38	12·46	15·17	13·34	14·79	14·61	8·17	10·37
6 ^h	13·98	15·72	14·98	10·80	7·01	7·12	7·48	9·52	13·16	15·70	13·89	14·61	14·81	8·66	10·71
7 ^h	12·22	14·64	13·36	10·04	7·29	8·02	7·87	11·02	12·23	14·15	12·13	12·24	13·12	8·89	9·98
8 ^h	8·60	11·67	10·82	9·29	8·12	8·09	8·67	11·43	12·09	11·07	8·90	9·01	10·01	9·09	8·53
9 ^h	4·40	7·04	6·22	5·95	7·05	8·54	8·97	10·72	9·57	6·78	4·23	4·32	5·50	7·95	5·70
10 ^h	2·23	2·18	1·89	2·86	5·47	6·08	6·98	8·26	5·89	2·73	0·17	1·00	1·70	5·40	2·53
11 ^h	0·00	0·00	0·00	0·42	3·42	3·78	4·11	5·26	1·54	0·00	0·00	0·00	0·00	2·54	0·25
Noon.	1·38	1·22	1·52	0·00	0·80	0·80	1·00	1·89	0·00	1·24	2·60	2·92	1·81	0·23	0·00
1 ^h	4·71	3·94	4·23	1·85	0·13	0·24	0·00	0·47	0·41	3·62	5·93	5·79	4·70	0·00	1·33
2 ^h	8·15	7·04	7·68	3·41	0·00	0·00	0·00	0·00	3·05	6·74	9·15	9·74	8·08	0·56	3·30
3 ^h	11·18	10·55	10·46	4·43	1·25	1·34	2·29	1·54	5·12	9·23	11·95	11·96	10·89	2·14	5·49
4 ^h	12·12	13·04	11·31	5·39	2·94	3·93	4·40	3·66	6·86	10·58	12·12	12·42	11·93	4·01	6·95
5 ^h	13·08	13·96	11·67	6·38	3·30	4·66	5·01	5·39	7·49	10·99	11·88	12·12	12·28	4·85	7·54
6 ^h	12·40	14·12	11·41	7·84	4·77	5·41	5·30	5·64	7·81	11·44	10·34	12·25	11·99	5·61	7·78
7 ^h	11·31	14·73	13·33	8·16	4·37	4·40	4·68	5·91	8·24	11·78	10·48	10·90	12·09	5·44	7·74
8 ^h	12·76	14·84	13·22	8·80	3·95	3·78	4·34	5·34	8·34	12·28	11·10	12·07	12·71	5·24	7·95
9 ^h	13·78	15·10	13·48	8·29	5·13	4·41	4·67	5·62	9·95	12·70	10·89	13·41	13·23	5·82	8·50
10 ^h	13·66	14·48	13·95	8·33	4·92	3·99	4·67	6·28	10·31	12·86	12·04	13·65	13·44	5·90	8·65
11 ^h	13·19	14·32	14·22	8·30	4·75	5·03	5·20	5·83	8·97	13·61	12·32	12·48	13·36	5·83	8·57
Means	10·498	11·643	6·734	7·033	4·534	4·797	5·017	6·167	8·139	10·567	9·903	10·617	10·687	5·426	7·035

In this, as in the former table, the monthly, yearly and semi-annual means have been taken, with the special object, however, in this case, of being inserted in the respective interpolation series. The values above given have been treated according to the method of the least squares and Bessel's formula, whereby we obtained the following equations:

<i>January</i> ... H. F. ⁽ⁿ⁾	=	10.498 + 4.981 sin (n 15° + 277°50') + 3.094 sin (n 30° + 302°23')
		+ 1.836 sin (n 45° + 317°25') +
<i>February</i> ...	=	11.643 + 5.651 sin (n 15° + 272°36') + 3.818 sin (n 30° + 285°44')
		+ 1.622 sin (n 45° + 306°22') +
<i>March</i>	=	6.734 + 5.420 sin (n 15° + 267°57') + 3.179 sin (n 30° + 293°22')
		+ 1.756 sin (n 45° + 321°51') +
<i>April</i>	=	7.033 + 3.732 sin (n 15° + 250°34') + 2.183 sin (n 30° + 268° 6')
		+ 0.948 sin (n 45° + 293°47') +
<i>May</i>	=	4.534 + 2.311 sin (n 15° + 213°35') + 1.766 sin (n 30° + 227°11')
		+ 0.843 sin (n 45° + 229°55') +
<i>June</i>	=	4.797 + 2.288 sin (n 15° + 207° 0') + 1.899 sin (n 30° + 234°44')
		+ 1.246 sin (n 45° + 228°56') +
<i>July</i>	=	5.017 + 2.108 sin (n 15° + 205°11') + 2.007 sin (n 30° + 230°17')
		+ 1.357 sin (n 45° + 230°40') +
<i>August</i>	=	6.167 + 3.110 sin (n 15° + 203°16') + 2.427 sin (n 30° + 223°49')
		+ 1.375 sin (n 45° + 227°13') +
<i>September</i> ..	=	8.139 + 4.087 sin (n 15° + 237°22') + 2.809 sin (n 30° + 254°38')
		+ 1.423 sin (n 45° + 284°10') +
<i>October</i>	=	10.567 + 5.207 sin (n 15° + 260°16') + 3.247 sin (n 30° + 288°44')
		+ 1.731 sin (n 45° + 316°14') +
<i>November</i> ..	=	9.903 + 4.056 sin (n 15° + 273°56') + 3.437 sin (n 30° + 312°57')
		+ 2.100 sin (n 45° + 328° 1') +
<i>December</i> ...	=	10.617 + 4.655 sin (n 15° + 275°48') + 3.318 sin (n 30° + 310°45')
		+ 2.058 sin (n 45° + 330°27') +
<i>Summer</i> ...	=	10.687 + 4.975 sin (n 15° + 271°10') + 3.293 sin (n 30° + 298°45')
		+ 1.833 sin (n 45° + 320°45') +
<i>Winter</i>	=	5.426 + 2.790 sin (n 15° + 223°17') + 2.109 sin (n 30° + 240°33')
		+ 1.062 sin (n 45° + 247°46') +
<i>Year</i>	=	7.035 + 3.578 sin (n 15° + 254°21') + 2.377 sin (n 30° + 276°39')
		+ 1.185 sin (n 45° + 295°24') +

When we examine the curves on Table 24, which have been derived, as already explained, from the last table, we perceive that the maximum in the horizontal force occurs between the hours 6^h and 9^h in the morning, from which time it decreases rapidly until it reaches its minimum value between the hours 11^h a.m. and 2^h p.m., in both cases the extremes occurring later in the day during the winter than during the summer season. The horizontal force afterwards reaches a secondary maximum in the afternoon about 4^h, from which hour it slightly decreases, and then gradually increases until again reaching its maximum in the forenoon. Such is the rule, but on glancing at the hourly means (Final Normals) for the single months, we find likewise many instances in which the maximum in the afternoon exceeds that in the forenoon — a fact which must be considered as the principal cause of the undulating character of the curves after the hour of 4^h p.m. In order to eliminate some of the larger irregularities, the hourly values of the horizontal force were in such cases entered in diagrams, and indicated by dots, while the curves were drawn so as to pass between them in a more regular sweep.

These curves exhibit some irregularities with respect to the time of the occurrence of the extremes, when compared with curves showing the horary variation in the horizontal force, as derived from observations made in other localities. So we find, for instance, that at Hobarton the maximum occurs between the hours 4^h and 5^h in the afternoon, during the months October, November, January, and February; in March and April it takes place between 8^h and 9^h in the evening; while during the months from May to September, it occurs between 6^h and 8^h in the morning. From the above table we perceive, on the other hand, that it takes place, throughout the whole year, between the hours 6^h and 9^h in the morning; and these curves show a far greater resemblance to the curves derived from observations made at Philadelphia, at which latter locality the primary maximum occurs as a rule between the hours 6^h and 8^h in the morning, the curves for May, June, July, and August, during which the primary maximum takes place between 3^h and 4^h in the afternoon, forming exceptions in this respect. On examining the single months, from October to March, we find that, of the thirty months from which the Hourly Variation Tables were obtained, only nine exhibit the primary maximum occurring about the hours 4^h or 5^h in the afternoon. On account of this apparent discrepancy it was thought necessary to derive the annual diurnal variation curve of the horizontal force for each of the single years of observation. The following is the result:

SOLAR DIURNAL VARIATION OF THE HORIZONTAL FORCE FOR EVERY ONE OF THE YEARS
OF OBSERVATION.

(One part equal to 0·0001 of the Horizontal Force.)

	NOON	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h
1858	0·66	2·23	3·99	5·39	6·34	6·90	6·81	7·05	7·19	7·57	7·78	8·18
1859	0·43	2·28	4·34	7·31	8·51	8·04	8·03	7·71	7·58	8·10	8·10	6·85
1860	0·00	1·03	3·11	5·67	7·32	8·07	8·13	8·87	8·83	8·96	8·75	8·91
1861	0·00	0·77	2·31	4·94	6·81	8·18	8·67	8·63	8·82	8·95	9·63	9·64
1862	0·00	1·50	3·92	5·36	7·06	7·84	9·02	8·18	8·97	10·54	10·68	10·98

	MIDN.	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h
1858	8·86	9·11	9·39	9·62	10·15	10·38	10·54	10·23	8·67	5·55	2·31	0·00
1859	7·46	7·05	6·99	7·24	7·49	8·13	8·77	7·80	6·42	4·06	1·56	0·00
1860	8·91	8·74	8·98	9·47	9·89	9·96	10·22	9·86	8·59	5·90	3·19	0·06
1861	10·08	10·43	10·60	10·66	11·07	11·51	11·98	11·09	10·08	6·67	3·63	1·07
1862	11·83	11·93	12·39	12·35	12·84	13·87	13·98	13·08	11·02	8·25	3·48	1·47

These curves agree exactly, as far as their general character is concerned, with one another, and with that for the five years of observation, so that we may feel sure of this peculiarity being observable throughout the whole series of observations. Whether however, this peculiarity of

the curves for the horizontal intensity be attributable to some local influence, or be due to some irregularity in the compensation for temperature applied to the magnets used for effecting the deflections, it is at present difficult to say, as the second series of observations on the horizontal force is not included in the present discussion.

17. Semi-annual Inequality in the Solar diurnal Variation of the Magnetic Horizontal Force. If we take the mean of the solar diurnal variation, derived from 24 hours, the larger disturbances having been eliminated, for summer, winter, and the year, we obtain, respectively, the means, 10.69, 5.43 and 7.03, expressed in parts equal to 0.0001 of the horizontal intensity. These mean values are then to be subtracted from the values for the several hours from which they were derived, in order to obtain the values in the following tables:

SEMI-ANNUAL INEQUALITY IN THE SOLAR DIURNAL VARIATION OF THE MAGNETIC HORIZONTAL FORCE.

	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Summer	-8.88	-5.99	-2.61	+0.20	+1.24	+1.59	+1.30	+1.40	+2.02	+2.54	+2.75	+2.67
Winter	-5.20	-5.43	-4.87	-3.29	-1.42	-0.58	+0.18	+0.01	-0.19	+0.39	+0.47	+0.40
Year	-7.03	-5.70	-3.73	-1.54	-0.08	+0.42	+0.75	+0.71	+0.92	+1.47	+1.62	+1.54
Summer <i>minus</i> year	-1.85	-0.29	+1.12	+1.74	+1.32	+1.17	+0.55	+0.69	+1.10	+1.07	+1.13	+1.13
Winter <i>minus</i> year	+1.83	+0.27	-1.14	-1.75	-1.34	-1.00	-0.57	-0.70	-1.11	-1.08	-1.15	-1.14

	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Summer	+3.06	+3.04	+3.53	+3.44	+3.72	+3.92	+4.12	+2.43	-0.68	-5.19	-8.99	-10.6
Winter	+1.04	+1.09	+1.09	+1.53	+2.00	+2.74	+3.23	+3.46	+3.66	+2.52	-0.03	-2.89
Year	+2.06	+2.07	+2.32	+2.49	+2.87	+3.34	+3.68	+2.95	+1.50	-1.33	-4.50	-6.78
Summer <i>minus</i> year	+1.00	+0.97	+1.21	+0.95	+0.85	+0.58	+0.44	-0.52	-2.18	-3.81	-4.49	-3.91
Winter <i>minus</i> year	-1.02	-0.98	-1.23	-0.96	-0.87	-0.60	-0.45	+0.51	+2.16	+3.85	+4.47	+3.89

The differences "summer *minus* year" and "winter *minus* year" represent the semi-annual inequality, and have been thrown into curves on Table 24.

18. Amplitude of the Solar Diurnal Variation of the Magnetic Horizontal Force. The table in this paragraph shows the amplitude in the solar diurnal variation for the various months and years of observation, derived from *all observations*, and also from *observations, the larger disturbances having been eliminated*. In the last column of each of these groups a mean amplitude for the whole period of observation is inserted.

AMPLITUDE IN THE SOLAR DIURNAL VARIATION OF THE HORIZONTAL FORCE.

MONTHS.	Derived from all observations.						Larger disturbances eliminated.					
	18 $\frac{5}{8}$	18 $\frac{5}{8}$	18 $\frac{5}{8}$	18 $\frac{5}{8}$	18 $\frac{5}{8}$	1858-63	18 $\frac{5}{8}$	18 $\frac{5}{8}$	18 $\frac{5}{8}$	18 $\frac{5}{8}$	18 $\frac{5}{8}$	1858-63
January...	17.00	15.09	13.74	19.30	16.69	16.36	14.96	14.85	12.11	21.16	17.53	16.12
February...	19.10	15.93	11.50	15.97	18.25	16.15	18.57	15.68	12.14	17.96	18.13	16.50
March....	(17.02)	15.11	15.08	15.11	15.75	15.61	(17.02)	14.80	15.51	15.40	15.95	15.74
April.....	(11.17)	10.22	12.10	9.77	16.06	11.86	(11.17)	10.12	11.75	9.40	13.87	11.26
May.....	8.54	7.17	12.50	4.03	14.00	9.25	7.23	7.74	11.39	5.40	10.64	8.48
June.....	7.88	5.50	10.76	13.89	11.06	9.82	7.68	6.41	10.96	11.48	11.78	9.66
July.....	6.81	5.62	13.23	15.05	12.55	10.65	6.48	5.46	11.94	15.75	12.23	10.37
August....	11.92	5.86	10.47	16.01	14.68	11.80	7.11	12.80	16.60	14.55	11.24	12.46
September.	14.48	9.58	13.72	20.00	13.58	14.27	14.73	11.42	13.10	20.78	15.11	15.03
October...	15.48	15.33	13.42	19.61	17.28	16.22	14.75	14.53	13.96	18.07	18.05	15.87
November.	16.14	14.36	12.76	18.55	16.15	15.59	16.28	13.99	9.56	18.81	17.69	15.27
December.	14.63	16.33	12.39	17.74	17.93	15.80	16.76	15.51	11.37	18.07	18.61	16.02
Summer ..	16.56	15.36	13.15	17.71	17.01	15.96	16.39	14.89	12.44	18.24	17.66	15.92
Winter ...	10.13	7.32	12.13	13.12	13.65	11.27	9.07	8.99	12.62	12.89	12.48	11.21
Year.....	13.35	11.34	12.64	15.42	15.33	13.62	12.73	11.94	12.53	15.57	15.07	13.57

The values in the above table enclosed within parentheses have been obtained by interpolation, as actual observations were wanting, or not sufficiently reliable, in those cases.

The mean amplitudes, as given in the last columns of each of the groups are somewhat different from those we obtain by the Hourly Variation Tables of the last paragraph; for from these we derive the following values for the mean amplitude in solar diurnal variation throughout the year:

WINTER MONTHS.	Mean Amplitudes, 1858-63.		SUMMER MONTHS.	Mean Amplitudes, 1858-63.	
	All Obser- vations.	Larger Disturbances eliminated.		All Obser- vations.	Larger Disturbances eliminated.
April... ..	11.64	10.80	October.	15.62	15.70
May	6.60	8.12	November	14.62	13.87
June	9.03	8.54	December	14.59	14.79
July	8.47	8.97	January	15.35	14.59
August.	11.22	11.43	February	15.59	15.72
September	12.87	13.16	March	15.21	15.29
Mean	9.972	10.170	Mean	15.163	14.993
Yearly mean	12.567	12.582			

The differences between these values and the corresponding values in the former table are due to the difference in the modes in which the amplitudes in the two cases were derived. In order fully to understand this, it must be borne in mind that, in the former case, the mean amplitudes for the whole period were obtained irrespective of the time at which the extremes occur in the single years, whereas in the latter the various values have been derived with respect to the single hours of the day, and consequently represent the more exact values of the amplitude in the diurnal variation for the single months and periods of the year.

In the table containing the mean amplitude for the various years of observation, we are particularly struck by a fact which must be spoken of here, as deviating from what we should have expected to be the case. The mean amplitudes for the several years show a minimum value in the year 1859—60, increasing towards the year preceding and following it; whereas, in the eleven years' period, the same year is the maximum with regard to magnetic declination and disturbances, and ought therefore to be characterized by a maximum value of the amplitude in the daily oscillation of the horizontal force. This anomaly is still more clearly exhibited in the table in paragraph 15, showing the mean annual variation in the horizontal force for the several years of observation. On referring to this table, we observe that the year 1859—60 shows, for nearly every hour during the twenty-four, a minimal value in the diurnal variation, and that this value increases both towards the preceding year and those which follow. The period of observation being too short to allow of a discussion with a view to decide the various questions relating to the eleven years' period in magnetic action, it must be left to future inquiry to determine, whether this apparent anomaly be merely accidental, and may be attributed to the irregularities in registration, unavoidably induced by the frequent alterations and shiftings in instruments of so delicate a nature; or whether we have here to do with an actual exception to what we feel disposed to adopt as the rule. I myself consider it most probable that the former supposition will ultimately prove to be the true one, for both the Hobarton and Philadelphia sets of observations, the former made during the years 1841—48, and the latter during the years 1840—45, show distinct signs of a decrease in the amplitude of the daily oscillation in the horizontal intensity towards the minimum year 1843—44.

For the purpose of comparing the amplitude of the solar diurnal variation of the horizontal force, as derived from the Melbourne observations, with the same quantities for four other localities, we may use the following little table:

PLACE.	Approximate Latitude.	MEAN AMPLITUDE FOR			Period of Observation.
		Summer.	Winter.	Year.	
Munich.	48° N.	15.20	6.56	10.88	1842
Toronto.	44° N.	19.40	13.10	15.50	1843—48
Hobarton	43° S.	18.95	10.60	14.80	1841—48
Philadelphia	40° N.	11.00	8.50	9.70	1840—45
Melbourne	38° S.	14.99	10.17	12.58	1858—63

It is evident that the values for the various stations are not immediately comparable, as they are derived from too unequal a number of years of observation, and as the various periods are quite differently situated with respect to the eleven years' period. They afford, however, a means of estimating roughly to what degree the Melbourne observations fit in, with respect to the amplitude in the diurnal variation of the horizontal force, with the general series of this value. We are particularly struck with the fact that Melbourne and Hobarton agree well with respect to the diurnal amplitude for the winter months, while for the summer months they exhibit a difference of 3.96 ten-thousandths of the horizontal force, an amount which we cannot but consider as too great, even after making all allowances for difference in geographical position. On examining the single months, we find that this difference manifests itself especially during the months of November, December, January, and February, and that it is in some measure due to the want of the primary maximum at 5^h p.m. in the Melbourne diurnal variation curve.

19. Lunar Diurnal Variation of the Horizontal Force. The process adopted in ascertaining the moon's influence upon the horizontal intensity is analogous to that already fully explained when treating of its influence upon the magnetic declination, and does not require any further special explanation. It need only be called to mind that the limit of disturbance fixed upon in this case amounted to 0.0012 of the horizontal force, which is equal to 0.00283 (0.00614 British unit) in absolute measure, the mean horizontal force for the whole period being adopted to be 2.3607 (5.1199 British unit). All observations differing from their respective final normals by that amount or more were omitted from the discussion. Those readings which remained after this process had been applied, are regarded as freed from the sun's effect, by subtracting the respective final normals for each hour from the readings. Let R be the reading for a certain hour, month, and year, and N the final normal for that hour, month, and year; the difference $R - N$ was taken for the corresponding reading devoid of the solar influence. These residuals in scale division were subsequently arranged in the usual manner according to lunar hours; a positive sign indicates a greater, and a negative sign a smaller, force than the final normal.

The course pursued in determining the lunar diurnal variation of the magnetic declination for the moon's or sun's declination, South or North, was also followed with respect to the horizontal force; and its lunar diurnal variation during the single years was in the first instance examined for the following different cases: viz., the sun's declination *North* (months from April to September) and the moon's declination South and the moon's declination North; the sun's declination *South* (months from October to March) and the moon's declination South and the moon's declination North. The first table in this paragraph contains the result of this inquiry for each of the years of observation. The scale divisions have been reduced to parts of the horizontal force, one part being equal to 0.0001. The number of observations from which each value was derived is inserted beside it in a second column.

The total number of observations available for this discussion amounts, according to the above table, to 34,903, of which 16,719 occur during the months from April to September, 18,184 during the months from October to March, 17,750 during the time the moon's declination was South, and 17,153 when the moon's declination was North.

LUNAR DIURNAL VARIATION OF THE HORIZONTAL FORCE. 1858-1863.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

MONTHS.	Moon's Declination.	YEAR	LUNAR HOURS.																							
			0		1		2		3		4		5		6		7		8		9		10		11	
			Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.
FROM APRIL TO SEPTEMBER.	SOUTH.	1858	+ 0.138	77	— 0.314	76	+ 0.709	74	+ 0.213	76	+ 0.459	77	+ 0.575	77	+ 0.479	77	+ 0.633	77	+ 0.659	78	+ 1.002	76	+ 1.144	72	+ 1.200	74
		1859	— 1.864	73	— 1.632	72	— 1.119	73	— 0.931	71	— 1.818	71	— 1.457	74	— 1.238	74	— 0.201	66	— 1.257	74	— 0.940	73	— 1.096	67	— 0.395	68
		1860	— 0.366	84	+ 0.065	82	— 0.743	85	+ 0.483	78	+ 0.112	83	+ 0.080	81	— 0.750	83	— 0.344	85	— 0.019	83	— 0.251	81	— 0.311	86	+ 0.166	84
		1861	— 0.935	70	— 0.979	66	— 0.708	68	— 1.198	68	— 0.326	68	+ 0.006	69	+ 0.149	69	+ 0.218	64	— 0.346	66	— 0.137	67	— 0.424	65	+ 0.527	68
		1862	— 1.091	55	— 0.925	49	— 1.458	50	— 1.312	52	— 0.353	49	— 1.419	52	— 1.032	53	— 1.172	49	— 1.102	49	— 1.198	49	— 0.195	49	— 1.051	49
	NORTH.	1858	— 1.320	69	— 1.431	69	— 1.248	70	— 0.722	70	— 0.980	70	— 0.958	67	— 0.845	70	— 0.402	68	— 0.663	66	+ 0.031	72	— 0.250	72	— 0.800	72
		1859	+ 1.522	75	— 0.538	73	+ 1.192	77	+ 1.206	75	+ 0.702	74	+ 1.405	73	+ 1.881	71	+ 1.371	70	+ 0.937	72	+ 1.190	77	+ 1.521	75	+ 1.411	75
		1860	— 0.333	73	— 0.179	72	+ 0.032	68	— 0.035	69	— 0.076	73	— 0.160	73	— 0.277	71	— 0.400	72	— 0.178	73	+ 0.102	70	+ 0.531	69	+ 0.255	68
		1861	— 0.111	80	— 0.180	78	— 0.553	82	— 0.246	80	+ 0.122	79	+ 0.127	80	— 0.104	85	— 0.303	84	+ 0.121	83	— 0.219	83	— 0.410	81	— 0.846	84
		1862	+ 0.440	51	+ 0.730	51	+ 0.978	52	+ 0.704	52	+ 1.436	54	+ 1.064	53	+ 0.981	55	+ 1.349	53	+ 1.248	52	+ 0.852	51	+ 0.746	51	+ 0.760	51
FROM OCTOBER TO MARCH.	SOUTH.	1858	— 0.101	90	+ 0.023	89	— 0.115	87	— 0.413	92	— 0.514	93	— 0.228	92	— 0.223	91	+ 0.100	86	+ 0.152	93	— 0.385	93	— 0.096	94	— 0.373	90
		1859	+ 0.282	95	+ 0.399	93	+ 0.913	91	+ 0.416	96	+ 0.412	90	+ 0.027	92	+ 0.051	94	— 0.359	94	— 0.009	91	+ 0.007	88	+ 0.016	91	+ 0.902	93
		1860	+ 0.051	77	+ 0.436	81	+ 1.104	80	+ 0.219	79	+ 0.597	81	+ 0.632	83	+ 0.459	83	— 0.014	82	+ 0.295	82	+ 0.705	76	+ 0.493	79	+ 0.572	79
		1861	+ 1.108	72	+ 1.240	72	+ 1.985	74	+ 0.154	71	+ 0.039	76	+ 0.282	78	+ 0.804	76	+ 0.835	77	+ 2.118	77	+ 0.691	72	+ 0.132	70	+ 0.472	77
		1862	+ 0.580	50	+ 0.668	52	+ 0.483	51	+ 0.169	53	+ 0.911	50	+ 0.288	49	+ 0.446	49	+ 0.207	50	— 0.012	53	+ 0.789	51	— 0.458	50	+ 0.723	49
	NORTH.	1858	+ 0.435	70	+ 1.018	69	+ 1.103	72	+ 0.799	72	+ 1.414	72	+ 0.516	71	+ 0.753	69	+ 0.598	67	+ 0.167	72	— 0.350	68	— 0.419	68	— 0.982	70
		1859	— 0.135	77	— 0.022	79	— 0.118	80	— 0.548	80	+ 0.027	74	— 0.018	76	+ 0.594	77	+ 0.337	76	— 0.181	79	— 0.174	77	— 0.179	80	+ 0.124	80
		1860	— 0.322	89	— 0.475	90	— 0.283	86	— 0.244	90	— 0.028	88	— 0.372	87	— 0.407	88	— 0.046	87	— 0.486	88	— 0.006	90	— 1.018	88	— 0.242	89
		1861	— 0.869	73	— 1.369	79	— 1.104	76	— 0.611	77	— 0.973	77	— 0.648	70	— 0.592	71	— 1.482	74	— 1.450	73	— 2.279	75	— 1.595	74	— 0.791	74
		1862	— 0.031	57	+ 0.256	57	— 0.265	56	+ 0.085	52	— 0.767	51	— 0.633	53	— 0.180	52	+ 0.526	53	+ 0.077	53	— 0.163	56	— 0.366	52	+ 0.309	56

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

MONTHS.	Moon's Declination.	YEAR.	LUNAR HOURS.																							
			12		13		14		15		16		17		18		19		20		21		22		23	
			Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.	Value.	No.
FROM APRIL TO SEPTEMBER.	SOUTH.	1858	+ 0.665	75	+ 0.697	75	+ 0.343	76	+ 1.214	74	+ 0.811	73	+ 0.866	75	+ 0.690	73	+ 1.677	73	+ 1.049	74	+ 0.981	72	+ 0.454	73	+ 0.258	77
		1859	— 1.149	74	— 0.347	71	— 0.672	67	— 0.789	67	— 1.123	67	— 1.007	71	— 1.949	72	— 1.328	72	— 1.404	71	— 1.412	74	— 1.380	75	— 1.172	69
		1860	— 0.588	85	— 0.234	81	+ 0.374	84	+ 0.143	80	+ 0.188	86	+ 0.438	83	— 0.024	89	+ 0.267	86	+ 0.623	87	+ 0.518	87	+ 0.058	88	+ 0.470	83
		1861	+ 0.306	68	+ 0.541	64	+ 0.313	66	— 0.077	66	— 0.091	65	— 0.481	65	— 0.864	67	— 0.318	70	— 0.516	68	— 0.402	66	— 0.862	68	— 1.106	70
		1862	— 1.669	48	— 1.285	54	— 0.868	52	— 0.564	51	— 1.475	50	— 0.665	48	— 0.962	52	— 1.004	51	— 1.196	53	— 1.647	53	— 2.260	52	— 1.046	51
	NORTH.	1858	+ 0.033	72	— 0.785	72	— 0.340	70	— 0.632	72	— 0.159	72	— 0.437	73	— 0.338	72	— 0.734	70	— 0.295	73	— 0.550	71	— 0.994	72	— 1.265	70
		1859	+ 1.085	70	+ 1.239	77	+ 0.399	72	+ 0.406	66	+ 1.576	66	+ 0.683	73	+ 1.753	77	+ 1.234	78	+ 0.175	77	+ 0.874	74	+ 0.424	74	+ 0.504	73
		1860	— 0.394	69	— 0.219	68	— 0.268	70	— 0.284	70	— 0.465	68	— 0.542	74	+ 0.752	69	— 0.110	69	— 0.377	73	+ 0.122	72	+ 0.224	73	+ 0.335	73
		1861	— 0.073	84	+ 0.508	83	+ 0.489	83	+ 0.376	83	+ 0.596	84	+ 0.636	84	+ 0.694	85	+ 0.039	82	+ 0.251	82	— 0.669	84	— 0.453	82	— 0.226	83
		1862	+ 0.865	51	+ 0.772	50	+ 0.532	53	+ 0.829	52	+ 0.277	51	+ 0.960	50	+ 0.602	52	+ 1.324	49	+ 0.850	51	+ 1.051	49	+ 0.719	49	+ 0.884	50
FROM OCTOBER TO MARCH.	SOUTH.	1858	— 0.984	91	— 0.017	88	+ 0.021	94	+ 0.389	94	+ 0.241	92	— 0.216	93	— 0.028	95	+ 0.103	97	— 0.120	94	— 0.272	94	+ 0.308	95	— 0.509	93
		1859	+ 0.515	97	— 0.699	96	+ 0.105	92	+ 0.432	92	+ 0.494	94	+ 0.413	96	+ 0.292	97	— 0.003	94	— 0.046	93	— 1.037	96	— 0.755	92	— 0.052	93
		1860	+ 0.282	84	+ 1.217	82	+ 0.962	81	+ 1.268	84	+ 1.116	84	+ 1.123	84	+ 1.171	81	+ 0.711	78	+ 0.104	78	— 0.394	82	— 0.191	83	+ 0.137	79
		1861	— 0.110	77	+ 0.272	77	+ 0.674	75	+ 0.690	74	+ 1.147	70	— 0.518	74	+ 1.045	71	+ 0.524	78	— 0.071	76	— 0.187	74	— 0.118	74	+ 0.714	72
		1862	+ 0.051	49	+ 0.650	55	+ 0.919	52	— 0.820	53	+ 0.003	51	+ 0.081	50	— 1.296	49	— 0.649	53	— 0.359	52	— 0.056	52	+ 0.045	49	+ 0.040	51
	NORTH.	1858	— 0.844	70	— 0.079	66	— 0.009	67	— 0.385	69	— 0.497	72	+ 0.033	70	+ 0.156	74	+ 0.735	71	+ 0.437	69	+ 0.254	72	+ 0.804	68	+ 0.645	70
		1859	— 0.063	79	+ 0.702	78	+ 0.624	78	+ 1.024	79	+ 1.397	78	+ 0.519	77	— 0.023	75	— 0.203	79	— 0.065	79	+ 0.103	76	+ 0.026	81	+ 0.021	75
		1860	— 0.029	86	+ 0.359	91	+ 0.324	88	+ 0.292	89	+ 0.281	91	— 0.477	90	— 0.442	93	— 0.277	93	— 0.281	90	— 0.516	91	+ 0.541	87	+ 0.288	91
		1861	— 0.941	74	— 0.567	75	— 1.193	77	— 0.040	75	— 0.666	74	— 0.629	71	— 0.988	72	— 1.090	66	— 2.411	71	— 1.352	68	— 1.016	71	— 0.453	77
		1862	— 0.272	56	+ 0.503	51	+ 0.315	54	+ 0.421	57	— 0.025	58	+ 0.440	61	— 0.344	56	+ 0.668	56	+ 0.707	57	— 0.293	62	— 0.952	59	— 0.408	59

We have inserted the preceding table, in order that those more especially interested in this matter might have an opportunity of examining into the nature of the lunar diurnal variation of the horizontal force during the single years of observation. In the following table the results of all the years are indiscriminately thrown into one, and nine groups are formed; viz.:

- Moon's declination South and North.
1. Sun's declination South and North. 2. Sun's declination South. 3. Sun's declination North.
- Moon's declination South.
4. Sun's declination South and North. 5. Sun's declination South. 6. Sun's declination North.
- Moon's declination North.
7. Sun's declination South and North. 8. Sun's declination South. 9. Sun's declination North.

All observations have been arranged with respect to these groups, for which subsequently the means were taken. It is scarcely necessary to mention that, as observations made in different scale divisions happened to fall within the same group, they had previously to be reduced to parts of the horizontal force; and that, in taking the means, due regard had to be paid to the number of observations from which they were derived.

LUNAR DIURNAL VARIATION OF THE HORIZONTAL FORCE. (1858—1863.)

1 part equal to 0.0001 of the Horizontal Force.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	0	1	2	3	4	5	6	7	8	9	10	11
South and North	South and North	−0.1495	−0.1635	+0.0530	−0.0827	+0.0047	−0.0295	+0.0372	+0.0092	+0.0133	−0.0443	−0.1190	+0.0941
South	" " "	+0.0739	+0.1686	+0.3673	−0.0160	+0.0943	−0.0083	+0.1528	−0.0462	+0.0697	−0.1444	−0.3362	+0.0606
North	" " "	−0.3812	−0.5350	−0.2857	−0.1564	−0.0813	−0.0523	−0.0852	+0.0693	−0.0484	+0.0626	+0.1168	+0.1307
South and North	South	−0.2005	−0.0629	+0.1626	−0.1674	−0.0495	−0.0790	−0.0709	−0.0692	+0.1077	+0.0393	−0.0514	+0.3074
South	"	+0.3378	+0.5093	+0.8635	+0.0984	+0.2196	+0.1783	+0.2697	−0.0339	+0.5038	+0.2869	+0.0454	+0.4279
North	"	−0.7780	−0.7053	−0.6044	−0.4687	−0.3511	−0.3661	−0.4468	−0.1095	−0.3405	−0.2327	−0.1611	+0.1710
South and North	North	−0.0909	−0.2702	−0.0588	+0.0042	+0.0711	+0.0231	+0.1515	+0.0905	−0.0858	−0.1286	−0.1878	−0.1227
South	"	−0.2029	−0.1844	−0.1463	−0.1365	−0.0408	−0.2141	+0.0242	−0.0597	−0.4013	−0.5922	−0.7409	−0.3256
North	"	+0.0269	−0.3638	+0.0340	+0.1550	+0.1869	+0.2679	+0.2806	+0.2451	+0.2470	+0.3520	+0.3875	+0.0912

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	12	13	14	15	16	17	18	19	20	21	22	23
South and North	South and North	−0.1511	+0.2195	+0.1589	+0.2339	+0.2291	+0.0713	+0.0407	+0.0860	−0.1368	−0.2560	−0.2400	−0.0871
South	" " "	−0.2173	+0.3751	+0.2475	+0.3766	+0.3757	+0.0765	+0.0111	+0.0602	−0.2147	−0.3941	−0.1135	+0.0351
North	" " "	−0.0786	+0.1124	+0.0620	+0.0735	+0.0649	+0.0656	+0.0726	+0.1140	−0.0535	−0.1051	−0.3760	−0.2198
South and North	South	−0.2120	+0.2615	+0.2366	+0.2742	+0.2196	+0.0596	−0.0915	+0.0615	−0.1320	−0.3656	−0.4027	−0.1885
South	"	−0.0398	+0.5540	+0.4749	+0.4735	+0.6148	+0.1966	+0.3304	+0.1775	−0.0802	−0.4308	−0.1564	+0.0341
North	"	−0.4079	−0.0760	−0.0355	+0.0401	−0.2334	−0.0994	−0.5614	−0.0702	−0.1898	−0.2920	−0.6746	−0.4352
South and North	North	−0.0871	+0.2370	+0.0783	+0.192	+0.2389	+0.0833	+0.1767	+0.1117	−0.1418	−0.1416	−0.0698	+0.0168
South	"	−0.4109	+0.1778	+0.0014	+0.2723	+0.1251	−0.0526	−0.3282	−0.0682	−0.3591	−0.3545	−0.0675	+0.0361
North	"	+0.2545	+0.2980	+0.1586	+0.1063	+0.3633	+0.2249	+0.7029	+0.3005	+0.0816	+0.0828	−0.0723	−0.0038

If we take the means for each of the above groups, we have:

One part = 0.0001 of the Horizontal Force.

SUN'S DECLINATION.	MOON'S DECLINATION		
	South.	North.	South and North.
South and North	—0.01804	+0.00354	—0.00744
South	+0.24308	—0.16857	+0.04421
North	—0.31195	+0.19618	—0.06360

From this we feel justified in concluding that, when the declination of the sun and moon are of the same name, there is an increase in the magnetic horizontal force perceptible, and when of an opposite character, a decrease. Moreover, we observe that, if the *Moon's* declination be indiscriminately North and South, there is an increase noticeable when the sun's declination is South, and a decrease when it is North; and if, on the other hand, the *Sun's* declination be indiscriminately North and South, there is an increase when the moon's declination is North, and a decrease when South. In the latter case, however, these differences are so very small that they may fairly be considered as accidental, and therefore as equal to zero.

In order to eliminate the inequality caused by these differences in the table preceding the last, we subtract the means from the respective columns, and obtain the following table:

LUNAR DIURNAL VARIATION OF THE HORIZONTAL FORCE. (1858—63)

1 part equal to 0.0001 of the Horizontal Force.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	0	1	2	3	4	5	6	7	8	9	10	11
South and North	South and North	—0.1421	—0.1581	+0.0604	—0.0753	+0.0172	—0.0220	+0.0447	+0.0166	+0.0207	—0.0368	—0.1116	+0.1016
South	" " "	+0.0297	+0.1244	+0.3231	—0.0602	+0.0501	—0.0525	+0.1086	—0.0904	+0.0255	—0.1886	—0.3804	+0.0164
North	" " "	—0.3176	—0.4714	—0.2221	—0.0928	—0.0177	+0.0113	—0.0216	+0.1329	+0.0152	+0.1262	+0.1804	+0.1943
South and North	South	—0.1825	—0.0449	+0.1806	—0.1494	—0.0315	—0.0610	—0.0529	—0.0512	+0.1257	+0.0573	—0.0334	+0.3254
South	"	+0.0947	+0.2667	+0.6204	—0.1447	—0.0235	—0.0648	+0.0266	—0.2770	+0.2607	+0.0438	—0.1977	+0.1848
North	"	—0.4661	—0.3934	—0.2925	—0.1568	—0.0392	—0.0542	—0.1349	+0.2024	—0.0286	+0.0792	+0.1508	+0.4829
South and North	North	—0.0944	—0.2737	—0.0623	+0.0007	+0.0676	+0.0196	+0.1480	+0.0870	—0.0893	—0.1321	—0.1913	—0.1262
South	"	—0.0343	—0.0158	+0.0223	+0.0321	+0.1278	—0.0455	+0.1928	+0.1089	—0.2327	—0.4236	—0.5723	—0.1570
North	"	—0.1693	—0.5600	—0.1622	—0.0412	—0.0093	+0.0717	+0.0844	+0.0489	+0.0508	+0.1558	+0.1913	—0.1050

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	12	13	14	15	16	17	18	19	20	21	22	23
South and North	South and North	—0.1437	+0.2569	+0.1664	+0.2414	+0.2366	+0.0788	+0.0481	+0.0934	—0.1294	—0.2486	—0.2326	—0.0796
South	" " "	—0.2615	+0.3309	+0.2033	+0.3324	+0.3315	+0.0323	—0.0331	+0.0160	—0.2589	—0.4383	—0.1577	—0.0091
North	" " "	—0.0150	+0.1760	+0.1256	+0.1371	+0.1285	+0.1292	+0.1362	+0.1776	+0.0101	—0.0415	—0.3124	—0.1562
South and North	South	—0.1940	+0.2795	+0.2546	+0.2922	+0.2376	+0.0776	—0.0735	+0.0795	—0.1140	—0.3476	—0.3847	—0.1705
South	"	—0.2829	+0.3109	+0.2318	+0.2304	+0.3717	—0.0465	+0.0873	—0.0656	—0.3233	—0.6739	—0.3995	—0.2090
North	"	—0.0960	+0.2359	+0.2764	+0.3520	+0.0785	+0.2125	—0.2495	+0.2417	+0.1221	+0.0199	—0.3627	—0.1233
South and North	North	—0.0906	+0.2335	+0.0748	+0.1888	+0.2354	+0.0798	+0.1732	+0.1082	—0.1453	—0.1451	—0.0733	+0.0133
South	"	—0.2423	+0.3464	+0.1700	+0.4409	+0.2937	+0.1160	—0.1596	+0.1004	—0.1905	—0.1859	+0.1011	+0.2047
North	"	+0.0583	+0.1018	—0.0376	—0.0899	+0.1671	+0.0287	+0.5067	+0.1043	—0.1146	—0.1134	—0.2685	—0.2000

On looking over the results of these tables, we gather the following additional information respecting the moon's influence on the horizontal force:

Ad 1. The lunar diurnal variation curve, derived from observations indiscriminately arranged with regard to the name of the sun's and moon's declination, and which may be named the *yearly* curve, shows considerable irregularities when compared with the same curve, derived from 7 years' observations at Kew. It exhibits, however, nevertheless the double fluctuation, which seems, with some exceptions which we shall presently have to point out, to be a distinctive characteristic. The primary maximum occurs between the hours 13^h and 16^h, and the primary minimum at 21^h, secondary extremes occurring respectively at 2^h and shortly before the lower culmination. The greatest range amounts to 0.0000505 of the horizontal force.

Ad 2. This curve exhibits also a distinct double fluctuation, the maxima being at 15^h and 2^h, and the minima at 21^h and 10^h, the greatest range amounting to 0.0000771 of the horizontal force.

Ad 3. This curve presents quite a different character to the former, there being only a single fluctuation, with a decided minimum at 1^h and a maximum at 11^h noticeable; being therefore exactly the reverse of the curve described under 2. The greatest range is, in this case, 0.0000686 of the horizontal force.

Ad 4. The yearly South curve (*i.e.*, all observations throughout the whole year, when the moon's declination is South, being thrown together) shows a primary maximum at 15^h and a secondary at 2^h, and a minimum at 22^h. The range amounts to 0.0000677. The value $+0.3074$, at 11^h, must be regarded as an accidental irregularity, which should not be taken into consideration.

Ad 5. The declination of sun and moon being South. We perceive in this case the double fluctuation very clearly, the primary maximum occurring at 2^h, the primary minimum at 21^h. The sweep of the curve is here the most regular of all the cases enumerated, the amplitude also reaching its greatest value, viz. 0.0001294 of the horizontal force.

Ad 6. Moon's declination South and sun's declination North. The lunar diurnal variation is in this case very indistinctly expressed, only a minimum at the moon's upper culmination and a maximum at 15^h being clearly recognizable. The range amounts to 0.0000818 of the horizontal force.

Ad 7. The yearly North curve (*i.e.*, all observations throughout the whole year, made when the moon's declination is North, being thrown together) shows great irregularity, so much so, that it scarcely deserves the name of a curve. To account for the indistinctness of the two diurnal variation curves described under 4 and 7, we need only to glance at those described under 2 and 3.

Ad 8. Moon's declination North and sun's declination South. The lunar diurnal variation curve partakes, in this case, of the general characteristic of a double fluctuation, minima occurring at 10^h and 20^h, and maxima at 15^h and 23^h. The greatest range amounts to 0.000103 of the horizontal force.

Ad 9. The declination of the sun and moon both North. This curve is nearly of the opposite character to the one described under 5, the declinations of which are both South. The minimum occurs at 1^h and the maximum at 18^h. The mean amplitude is, in this case, as in no. 5, comparatively speaking, very great, viz. 0.0001067 of the horizontal force.

Notwithstanding the considerable irregularities observable in the above results, we may draw the following inferences from them:

I. *With respect to the amount of the amplitude* in the lunar diurnal variation of the horizontal force, we shall have to consider it under two classes; namely, such results as have been derived from half the number of available observations (2, 3, 4, and 7), and such as have been derived from a quarter of that number (5, 6, 8, 9). When the observations are grouped indiscriminately with regard to the moon's declination, the amplitude of the lunar diurnal variation seems to be a maximum when the sun's declination is South; and when indiscriminately with regard to the sun's declination, the amplitude is greatest when the moon's declination is South. In respect to the second class of cases, we arrive at the following conclusion: When the declinations of the sun and moon are both North or both South, the daily amplitude in the lunar diurnal variation is greatest (on an average, 0.0001180), and if the former be the case, this amplitude is a maximum. When, on the other hand, the declinations of the sun and moon are of opposite names, the amplitude is least (on an average 0.0000915), and a minimum if the sun's declination be North.

II. *With respect to the form or general character of the curves*, we feel disposed to group them thus: (1) when the sun's declination is South (2, 5, 8), and (2) when the sun's declination is North (3, 6, 9). In the first group, we perceive throughout the double fluctuations clearly expressed, with a primary maximum near 1^h (case 8 excepted) and a primary minimum at 21^h; in the latter we observe curves with but one minimum at about the lower culmination.

These results show clearly that in this case also, as in that of the lunar diurnal variation of the magnetic declination, a distinction should be drawn with regard to the moon's declination; and I have no doubt but that further inquiry, based upon other sets of observations, will prove this assertion to be true.

In order to enable those especially interested in this matter to examine more closely the conclusions arrived at, and chiefly with a view to investigate into the nature of the various curves throughout the various years of observation, we subjoin the following two tables, comprising the results for the years 1860 and 1861, they being the only two entire years during which a complete set of hourly observations was made.

LUNAR DIURNAL VARIATION OF THE HORIZONTAL FORCE. 1860.

1 part equal to 0.0001 of the Horizontal Force.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	0	1	2	3	4	5	6	7	8	9	10	11
South and North	South and North	-0.3086	-0.0845	-0.1174	+0.0623	+0.1878	-0.0865	-0.2677	-0.2345	-0.1438	-0.1224	-0.1946	+0.1210
South	" " "	-0.2707	-0.1149	+0.1283	-0.0843	+0.3345	-0.1333	-0.0365	-0.1149	-0.1881	-0.1520	-0.4158	+0.0487
North	" " "	-0.3503	-0.0498	-0.3986	+0.2397	+0.0241	-0.0336	-0.5322	-0.3700	-0.0932	-0.0875	+0.0637	+0.2056
South and North	South	-0.4309	-0.0073	-0.1526	+0.1130	+0.2176	-0.2932	-0.8478	-0.6930	-0.2844	-0.3267	-0.3574	+0.0512
South	"	-0.5041	-0.0853	+0.5440	-0.2717	+0.3361	-0.6963	-0.9559	-1.0728	-0.5784	-0.4115	-0.4093	-0.0775
North	"	-0.3656	+0.0640	-0.7427	+0.4829	+0.1120	+0.0800	-0.7501	-0.3445	-0.0188	-0.2514	-0.3109	+0.1661
South and North	North	-0.1948	-0.1546	-0.0851	+0.0171	+0.1607	+0.1009	+0.2649	+0.2000	-0.0175	+0.0583	-0.0412	+0.1859
South	"	-0.0920	-0.1369	-0.1622	+0.0522	+0.3335	+0.2931	+0.6462	+0.6322	+0.0961	+0.0285	-0.4207	+0.1406
North	"	-0.3327	-0.1794	+0.0316	-0.0352	-0.0759	-0.1597	-0.2775	-0.4001	-0.1778	+0.1020	+0.5307	+0.2546

LUNAR DIURNAL VARIATION OF THE HORIZONTAL FORCE. 1860.

1 part equal to 0.0001 of the Horizontal Force.

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	12	13	14	15	16	17	18	19	20	21	22	23
South and North	South and North	-0.1191	+0.2675	+0.3858	+0.4167	+0.5831	+0.2715	+0.4965	+0.2057	+0.3086	-0.0705	-0.0854	+0.0405
South	" " "	+0.2107	+0.6813	+0.6577	+0.8318	+1.1714	+0.5339	+0.6624	+0.2985	+0.4398	-0.4381	-0.2855	-0.2859
North	" " "	-0.5014	-0.2269	+0.6822	-0.0564	-0.1006	-0.0244	+0.3149	+0.0992	+0.1666	+0.3388	+0.1334	+0.4068
South and North	South	-0.3864	-0.1288	+0.2955	+0.2122	+0.6620	+0.5288	+0.3140	+0.0385	+0.2769	-0.2947	-0.6319	-0.1195
South	"	-0.1634	-0.0155	+0.2062	+0.3514	+1.1984	+0.6283	+0.7207	-0.2265	-0.1410	-1.2254	-1.4631	-0.7899
North	"	-0.5885	-0.2338	+0.3742	+0.1426	+0.1879	+0.4377	-0.0240	+0.2670	+0.6227	+0.5184	+0.0579	+0.4700
South and North	North	+0.1326	+0.6290	+0.4708	+0.5756	+0.5084	+0.0376	+0.6736	+0.3622	+0.3375	+0.1407	+0.4146	+0.1832
South	"	+0.4855	+1.1886	+0.9986	+1.1896	+1.1514	+0.4630	+0.6188	+0.6785	+0.8538	+0.1542	+0.5994	+0.0747
North	"	-0.3942	-0.2187	-0.2681	-0.2838	-0.4654	-0.5428	+0.7522	-0.1100	-6.3770	+0.1218	+0.2244	+0.3349

LUNAR DIURNAL VARIATION OF THE HORIZONTAL FORCE. 1861.

1 part equal to 0.0001 of the Horizontal Force.

1st. FROM THE SUPERIOR TO THE INFERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	0	1	2	3	4	5	6	7	8	9	10	11
South and North	South and North	-0.2425	-0.4305	-0.0486	-0.2972	-0.0315	+0.1851	+0.3301	+0.0520	+0.0726	+0.1079	-0.1331	+0.0270
South	" " "	-0.0049	-0.3291	+0.4869	+0.0537	+0.0162	+0.2902	+0.6425	+0.1702	+0.2193	+0.3867	+0.1320	+0.2714
North	" " "	-0.4944	-0.5460	-0.6235	-0.6836	-0.0851	+0.0709	+0.0096	-0.0775	-0.0859	-0.1821	-0.4164	-0.2319
South and North	South	-0.0053	+0.0074	+0.6449	+0.1119	+0.3267	+0.8239	+1.1803	+0.7440	+0.7025	+0.8363	+0.5691	+1.1952
South	"	+0.7789	+0.7641	+1.6905	+1.1602	+0.8144	+1.4238	+1.9798	+1.1260	+1.1136	+1.6035	+1.3286	+1.7058
North	"	-0.9351	-0.9786	-0.7082	-1.1985	-0.3259	+0.0064	+0.1490	+0.2184	-0.3462	-0.1370	-0.4241	+0.5269
South and North	North	-0.4752	-0.8572	-0.7466	-0.6933	-0.4038	-0.5182	-0.5421	-0.6401	-0.5654	-0.0611	-0.8260	-1.1487
South	"	-0.8609	-1.5345	-0.9638	-1.1522	-0.9653	-1.2768	-1.0825	-1.0389	-1.3680	-1.0699	-1.3006	-1.5017
North	"	-0.1087	-0.1799	-0.5533	-0.2459	+0.1221	+0.1265	-0.1035	-0.3030	+0.1211	-0.2185	-0.4101	-0.8462

2nd. FROM THE INFERIOR TO THE SUPERIOR PASSAGE.

DECLINATION		LUNAR HOURS.											
of the Sun.	of the Moon.	12	13	14	15	16	17	18	19	20	21	22	23
South and North	South and North	+0.1768	+0.6053	+0.5145	+0.4567	+0.3578	+0.1671	+0.1597	+0.2927	-0.2937	-0.4020	-0.0457	-0.1806
South	" " "	+0.2518	+0.6780	+0.6701	+0.7035	+0.4131	+0.1832	+0.2977	+0.6878	-0.4725	-0.2659	-0.2894	+0.2324
North	" " "	+0.0965	+0.5226	+0.4107	+0.1752	+0.2965	+0.1489	+0.0071	-0.1256	-0.0971	-0.5516	-0.6389	-0.6287
South and North	South	+0.8066	+1.1297	+1.0220	+0.8876	+0.6148	+0.3767	+0.3494	+0.8563	+0.1221	+0.2163	-0.0308	+0.0811
South	"	+1.1687	+1.5305	+1.5366	+1.5577	+1.1134	+0.9694	+1.2334	+1.7906	-0.6100	+0.6747	+0.6047	+1.0362
North	"	+0.3060	+0.5412	+0.3126	-0.0768	-0.0909	-0.4804	-0.8643	-0.3183	-0.5165	-0.4020	-0.8625	-1.1060
South and North	North	-0.4899	+0.0740	+0.0133	+0.0176	+0.1008	-0.0452	-0.0277	-0.2817	-0.7069	-1.0009	-0.8858	-0.4342
South	"	-0.9974	-0.4197	-0.5059	-0.3784	-0.4693	-0.8290	-0.8350	-0.6416	-1.7403	-1.3675	-1.3649	-0.6528
North	"	-0.0731	+0.5083	+0.4487	+0.3755	+0.5963	+0.6359	+0.6941	+0.0388	+0.2507	-0.6692	-0.4534	-0.2263

As in the case of the lunar diurnal variation for the five years of observation, we have also for the single years taken the means for each of the several groups, and the subsequent table shows the result:

1 part equal to 0.0001 of the Horizontal Force.

SUN'S DECLINATION.	MOON'S DECLINATION.					
	South.		North.		South and North.	
	1860	1861	1860	1861	1860	1861
South and North	— 0.093	+ 0.568	+ 0.205	— 0.486	+ 0.0622	+ 0.0423
South	+ 0.236	+ 1.238	+ 0.407	— 1.012	+ 0.144	+ 0.224
North	+ 0.014	— 0.326	— 0.083	— 0.017	— 0.030	— 0.155

It needs scarcely to be specially pointed out that, in obtaining the results embodied in the tables for 1860 and 1861, only such observations as were made during the respective years have been included, so that for the period from October to March (sun's declination South) the first and last three months had to be made use of. Subsequently a second discussion was made whereby the results were derived for the years 1860—61 and 1861—62, in such a manner that only observations for *consecutive* months were grouped together. We refrain, however, from subjoining the results of this discussion here, as they add but little to our knowledge on the subject of lunar diurnal variation of the horizontal force, and as it is, moreover, intended to embody all information respecting this matter in a special treatise, for which both time and space are wanting here.

IV. DISTURBANCES.

20. The limits of disturbance have in each case, the magnetic declination and horizontal force, been already explained when speaking of the manner in which the final normals were derived. In the subsequent discussion all observations differing from the respective final normals by the limit of disturbance or more, have been treated as disturbances. We will first treat of the disturbances in the magnetic declination, and then of those in the horizontal force. A similar treatment of the observations on the magnetic inclination could not be undertaken for reasons fully explained in the preface to this volume when detailing the general principles by which I was guided in framing its extent and plan.

MAGNETIC DECLINATION.

21. The limit of disturbance adopted in this case was 3.61 minutes; and a distinction was drawn with regard to whether the disturbance caused the magnetic declination to become greater, *i.e.* to the East (E.), or to become less, *i.e.* to the West (W.) of the main direction. We subjoin here the results of this treatment:

NUMBER OF EASTERLY (E.) AND WESTERLY (W.) DISTURBANCES IN THE MAGNETIC DECLINATION
THROUGHOUT THE WHOLE PERIOD OF OBSERVATION.

(Months from April to September.)

MONTHS.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
1858 May ...	—	1	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
" June ...	—	2	—	1	—	1	—	1	—	—	—	—	—	—	1	—	1	—	2	—	2	—	1	—
" July ...	—	3	—	3	—	1	—	1	—	—	1	—	3	—	1	—	1	—	1	—	1	—	—	—
" August ...	2	2	2	1	1	1	—	—	2	—	—	—	—	—	1	—	—	—	1	—	1	2	1	1
" September ...	2	3	2	1	1	2	—	2	1	1	—	1	1	—	1	—	—	—	—	—	1	—	1	—
1859 April ...	3	2	2	3	3	2	—	4	1	2	3	2	—	—	2	—	1	—	—	—	—	—	1	1
" May ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" June ...	9	9	10	9	8	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" July ...	1	5	5	1	2	6	4	4	4	4	4	4	3	4	4	5	4	6	4	5	4	3	3	1
" August ...	4	1	5	2	5	1	6	3	7	3	5	4	2	4	3	4	4	3	5	1	4	1	3	4
" September ...	8	6	9	8	8	7	9	7	9	8	9	6	8	6	5	8	6	6	5	4	3	5	3	4
1860 April ...	—	3	1	2	1	1	1	2	2	—	1	1	1	—	—	—	3	—	2	—	2	—	—	—
" May ...	—	—	—	4	—	2	—	1	1	2	1	—	1	1	—	—	1	—	—	—	—	—	—	—
" June ...	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	1
" July ...	—	1	—	—	—	1	—	—	1	—	—	—	1	—	1	—	—	—	—	—	2	—	1	—
" August ...	—	6	1	3	1	4	2	4	1	2	1	—	3	—	3	—	1	—	2	1	—	—	1	—
" September ...	1	1	—	1	—	1	1	1	3	—	—	1	—	2	2	4	4	3	2	2	1	1	—	—
1861 April ...	—	3	—	3	—	1	1	1	—	3	1	2	1	2	1	2	2	1	3	—	—	—	—	—
" May ...	3	4	2	4	4	4	5	2	5	3	3	5	3	5	4	1	2	4	—	3	—	—	—	—
" June ...	—	2	—	1	—	1	—	—	1	1	—	—	2	1	4	1	1	—	2	1	1	1	1	1
" July ...	—	1	—	1	1	1	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
" August ...	—	4	—	3	—	2	—	3	—	2	1	—	2	—	1	—	2	—	2	—	1	—	2	—
" September ...	—	1	—	1	—	2	—	1	—	—	—	—	1	—	—	—	2	—	2	—	—	—	—	—
1862 April ...	—	1	—	2	1	1	1	1	1	1	1	1	—	—	1	—	1	—	1	—	—	—	—	—
" May ...	—	1	—	1	—	—	1	1	1	1	—	—	1	—	—	—	2	—	—	—	—	—	—	—
" June ...	4	—	3	—	1	—	2	—	3	—	2	—	3	—	3	—	3	—	4	1	4	—	4	—
" July ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" August ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" September ...	4	5	4	5	6	5	3	9	3	7	—	4	1	4	2	4	4	4	1	5	3	5	5	5
Sums...	41	68	47	61	43	55	36	48	47	40	33	31	34	31	38	32	45	29	37	25	30	18	28	18

MONTHS.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
1858 May ...	—	—	2	—	1	1	1	—	—	—	—	1	—	—	—	1	1	1	—	1	—	1	—	—
" June ...	1	—	—	—	1	—	2	—	2	1	1	1	2	—	2	—	1	—	3	—	—	—	—	—
" July ...	—	—	—	—	—	—	—	—	—	—	2	—	3	—	—	1	1	1	—	2	1	2	—	—
" August ...	—	—	1	—	—	—	1	—	1	—	—	—	1	1	—	—	1	—	1	1	3	1	1	1
" September ...	—	—	1	—	2	—	2	—	2	1	1	—	2	—	3	2	3	4	3	1	2	3	1	1
1859 April ...	5	—	2	—	3	—	2	1	3	—	1	—	—	1	1	2	1	3	2	3	2	3	1	2
" May ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" June ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" July ...	3	3	3	1	3	2	7	1	5	1	3	1	5	3	4	2	2	3	2	3	2	3	2	1
" August ...	1	7	2	3	4	6	3	4	1	4	4	4	3	5	5	5	3	1	4	2	4	1	2	2
" September ...	5	6	5	5	2	7	3	6	3	6	5	6	6	6	5	7	7	7	10	9	8	12	7	7
1860 April ...	1	—	—	—	1	—	—	—	2	—	1	1	1	2	1	1	—	2	—	—	2	—	1	—
" May ...	—	—	—	—	1	—	—	—	1	—	—	—	—	—	1	1	—	—	—	—	1	1	—	2
" June ...	—	—	—	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	1	—	1	—
" July ...	1	—	—	—	1	—	—	—	—	—	1	—	—	—	1	—	—	3	—	1	2	—	—	2
" August ...	—	—	1	—	—	—	2	1	1	1	1	—	1	1	1	1	—	2	—	1	—	3	1	4
" September ...	—	—	—	1	1	—	1	1	1	—	2	—	—	—	1	1	1	2	—	1	—	3	—	2
1861 April ...	—	1	1	—	4	—	3	1	1	1	1	2	—	4	1	6	1	8	—	5	—	3	1	10
" May ...	—	—	—	1	—	1	—	2	—	3	1	3	3	4	1	4	1	3	1	5	2	5	3	4
" June ...	—	—	—	1	1	2	—	3	—	4	—	3	—	—	1	2	1	1	—	2	—	2	1	4
" July ...	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	1	—	2	—	—
" August ...	1	—	—	—	1	—	—	—	—	—	—	—	2	—	2	1	—	2	—	3	—	4	1	2
" September ...	—	—	—	—	1	—	1	—	—	1	—	—	1	—	—	—	1	—	3	1	—	1	—	—
1862 April ...	—	—	—	—	1	1	1	—	3	—	2	1	—	—	—	2	—	2	—	5	—	2	—	2
" May ...	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	1	1	—	—
" June ...	3	—	3	3	2	1	3	1	4	—	5	—	5	—	4	1	4	2	4	3	4	2	5	2
" July ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" August ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" September ...	7	5	8	7	8	9	9	4	6	6	9	8	6	8	7	3	7	5	8	7	8	6	6	9
Sums...	28	22	29	24	39	30	41	25	36	29	41	31	43	36	40	45	33	57	34	62	39	65	33	59

NUMBER OF EASTERLY (E.) AND WESTERLY (W.) DISTURBANCES IN THE MAGNETIC DECLINATION
THROUGHOUT THE WHOLE PERIOD OF OBSERVATION.

(Months from October to March.)

MONTHS.				MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h		
				E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
1858	October	...	...	—	1	—	1	—	—	—	1	—	—	1	—	2	—	1	1	1	—	1	—	1	1	2	1	—
"	November	...	...	1	2	2	1	1	2	—	1	1	—	2	—	3	1	2	—	3	2	1	1	—	1	1	—	—
"	December	...	...	9	3	10	2	9	3	11	4	11	5	10	5	11	4	8	5	5	5	6	5	8	1	4	2	
1859	January	...	...	6	2	5	1	5	1	6	2	5	3	5	3	5	3	5	—	3	4	6	5	3	6	2	2	
"	February	...	...	—	3	—	4	—	4	—	5	—	3	—	2	—	3	8	1	1	3	2	6	3	3	2	1	
"	March	...	...	—	4	—	3	—	3	1	1	—	1	—	1	—	—	—	—	1	1	1	2	3	—	—	—	
"	October	...	...	1	6	1	6	2	4	—	3	—	2	2	2	2	3	—	3	—	3	1	2	1	—	—	—	
"	November	...	...	—	3	—	3	—	2	1	1	—	—	1	1	1	1	1	1	—	1	—	—	2	1	2	4	
"	December	...	...	—	2	—	1	—	—	—	1	—	1	—	1	—	1	—	3	3	1	3	1	2	4	1	1	
1860	January	...	...	—	—	—	1	—	2	1	1	—	1	1	1	1	2	1	1	—	1	1	1	1	2	4	2	
"	February	...	...	—	1	—	1	—	2	—	2	—	1	2	—	1	1	1	2	1	—	1	—	2	4	—	1	
"	March	...	...	—	5	—	2	1	1	—	1	—	2	2	1	2	—	3	2	4	1	3	—	1	1	—	1	
"	October	...	...	—	1	—	1	—	1	—	1	—	—	1	—	1	2	1	2	—	1	—	1	1	—	1	—	
"	November	...	...	—	1	—	1	—	2	—	1	—	2	—	—	2	—	1	—	1	—	—	—	3	1	6	1	
"	December	...	...	—	1	—	—	—	—	1	—	—	—	—	—	1	—	2	2	1	—	3	5	2	5	2	6	
1861	January	...	...	—	4	—	2	—	2	—	1	1	—	—	2	1	—	—	1	2	—	3	1	3	4	4	6	
"	February	...	...	—	—	—	1	—	1	—	—	1	1	1	—	—	—	—	—	2	1	—	—	1	—	2	—	
"	March	...	...	—	2	1	3	—	5	—	7	1	2	1	4	1	2	2	1	2	1	2	—	1	2	—	2	
"	October	...	...	—	2	—	2	—	1	—	2	—	1	—	1	—	—	1	2	1	1	1	2	—	—	—	—	
"	November	...	...	—	2	—	4	—	4	—	4	1	1	—	1	1	—	2	2	—	1	1	—	—	—	—	—	
"	December	...	...	—	3	1	5	—	2	—	1	2	1	2	3	2	3	2	3	2	1	—	—	1	1	2	1	
1862	January	...	...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
"	February	...	...	1	—	1	4	—	—	1	2	1	1	1	3	2	4	1	2	2	1	—	1	—	2	1	1	
"	March	...	...	—	1	—	2	—	1	—	—	—	1	—	—	—	—	1	—	1	—	1	—	—	—	—	—	
"	October	...	...	2	5	1	4	1	4	1	4	2	2	3	3	4	3	4	3	3	—	2	1	1	—	1	—	
"	November	...	...	—	1	1	1	—	1	—	2	1	1	—	1	2	—	—	—	1	—	1	—	2	—	2	—	
"	December	...	...	—	5	1	6	1	3	—	3	—	2	—	3	4	1	2	—	2	—	2	—	3	1	2	1	
1863	January	...	...	—	2	1	4	1	2	1	3	—	—	1	—	4	2	2	2	1	4	5	—	1	2	1	1	
"	February	...	...	—	3	—	2	—	2	—	3	1	1	—	—	—	—	2	—	4	—	1	—	—	1	—	1	
Sums				20	65	25	68	21	55	24	57	28	35	35	39	52	34	57	35	51	29	51	31	46	48	41	37	

MONTHS.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
1858 October ...	1	2	1	—	—	—	—	1	—	—	—	—	1	2	—	1	—	2	—	—	1	2	—	—
„ November ...	1	3	2	3	1	1	—	—	—	—	—	—	1	1	1	1	1	1	—	1	1	1	1	—
„ December ...	5	4	5	1	3	3	3	2	5	3	6	1	7	—	8	2	7	2	6	3	7	6	9	4
1859 January ...	3	3	1	1	3	1	5	—	5	4	6	1	3	—	6	1	6	1	4	2	9	2	6	2
„ February ...	1	1	2	—	—	1	2	—	1	—	1	3	—	3	—	5	—	3	—	3	—	2	1	2
„ March ...	—	1	—	1	—	1	—	—	1	1	1	—	—	—	2	—	2	1	2	1	6	1	1	—
„ October ...	1	1	1	2	2	2	2	1	2	1	1	—	—	1	—	2	—	1	—	3	—	4	—	1
„ November ...	2	3	1	1	—	—	—	—	—	—	—	—	—	—	1	1	—	2	—	—	1	3	—	3
„ December ...	2	2	1	—	—	1	1	—	—	—	—	—	—	—	1	—	2	—	4	—	4	—	1	—
1860 January ...	—	5	1	4	1	4	3	2	1	1	2	—	2	1	1	—	—	—	—	—	3	—	1	—
„ February ...	—	2	—	1	1	—	—	1	1	1	—	—	—	—	—	—	—	—	2	—	4	—	2	—
„ March ...	1	3	1	3	—	4	1	3	2	1	1	1	1	2	1	2	—	2	—	2	—	4	—	4
„ October ...	1	—	3	1	2	1	—	1	—	—	—	—	—	—	—	—	—	—	—	4	—	—	2	—
„ November ...	5	1	6	1	9	1	1	1	—	1	—	—	—	—	—	—	—	—	1	—	—	4	1	—
„ December ...	6	5	5	4	4	5	2	5	—	9	—	4	—	2	—	3	—	2	1	—	1	2	—	1
1861 January ...	5	1	4	1	2	—	—	1	1	—	1	2	1	—	—	2	—	3	—	3	—	4	—	3
„ February ...	—	—	1	2	1	1	—	1	—	2	—	—	—	—	1	—	—	—	3	—	3	—	2	—
„ March ...	1	4	1	1	—	2	—	1	—	—	—	—	—	—	—	—	3	—	1	—	3	—	2	—
„ October ...	—	—	—	—	—	1	2	—	—	—	—	—	1	—	1	—	—	—	—	—	5	—	—	—
„ November ...	—	1	—	2	1	1	—	1	—	—	—	—	1	—	1	1	—	1	—	1	—	4	—	1
„ December ...	2	—	1	—	—	—	1	—	1	—	—	—	—	—	—	—	1	—	—	—	4	—	—	—
1862 January ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ February ...	1	1	3	2	2	4	1	1	1	1	1	—	1	2	1	—	—	1	2	—	2	1	2	—
„ March ...	1	1	2	1	—	—	1	—	1	—	1	—	1	—	—	1	—	1	—	1	—	2	—	5
„ October ...	2	—	1	3	1	2	1	1	1	—	1	—	2	—	—	1	—	3	—	7	—	3	—	4
„ November ...	—	1	—	—	—	—	—	—	—	—	—	1	—	1	—	1	—	3	—	3	—	1	1	3
„ December ...	4	2	3	3	—	3	1	—	1	1	1	1	2	1	2	2	2	1	—	3	1	4	—	4
1863 January ...	2	1	3	2	4	—	3	1	—	—	—	—	—	—	1	—	1	—	1	—	2	—	5	—
„ February ...	1	2	1	3	1	1	1	2	—	1	—	1	—	1	1	—	3	—	3	—	1	—	1	—
Sums ...	48	47	50	43	38	39	30	28	24	27	23	15	23	18	23	33	17	39	14	54	22	80	24	61

MONTHLY AGGREGATE AMOUNTS OF DISTURBANCE OF MAGNETIC DECLINATION EAST (E.) AND WEST (W.)
IN SCALE DIVISIONS. (1858-1863)
(Months from April to September.)

MONTHS.	Val. of a sc. div.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
		E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
1858 May ...	0.802	—	4.6	—	5.5	—	—	—	—	—	—	—	—	—	—	5.4	—	—	—	—	—	—	—	—	—
" June ...	"	—	10.4	—	6.0	—	6.1	—	6.1	—	—	—	—	—	—	14.3	—	8.9	—	16.9	—	13.0	—	5.7	—
" July ...	"	—	19.3	—	22.7	—	8.3	—	9.3	—	—	8.5	—	35.9	—	12.2	—	13.9	—	14.7	—	8.6	—	—	—
" August ...	"	8.4	11.9	9.8	4.6	4.6	6.1	—	—	11.5	—	—	—	—	—	5.6	—	—	—	—	6.5	6.8	10.4	5.0	4.6
" September ...	"	9.6	20.6	9.1	6.1	4.6	11.1	—	14.4	4.5	5.3	—	5.1	5.1	—	7.1	—	—	—	—	6.9	—	6.8	—	—
1859 April ...	"	14.3	14.1	8.9	28.0	18.5	17.6	—	23.7	4.4	22.1	21.9	7.6	—	—	12.3	—	6.5	—	—	—	—	—	4.5	6.3
" May ...	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" June ...	"	64.0	56.1	69.1	63.8	60.8	62.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" July ...	"	6.1	34.4	25.6	10.3	7.4	46.6	26.4	32.4	30.3	28.5	27.7	25.3	32.7	26.8	36.1	36.2	28.4	48.0	32.7	39.7	31.4	20.4	27.9	7.3
" August ...	"	32.7	4.7	29.9	9.9	30.8	6.8	38.2	15.8	39.7	14.0	25.1	21.4	9.4	21.4	20.7	21.4	23.5	15.4	28.4	26.3	19.9	31.5	12.0	39.1
" September ...	"	55.0	58.0	56.1	82.9	52.8	62.3	60.4	65.2	62.7	70.4	54.4	52.3	45.5	61.9	31.9	79.3	52.3	56.1	34.7	34.7	20.8	38.1	26.6	31.1
1860 April ...	"	—	16.9	5.3	15.3	5.2	9.9	4.5	13.0	9.5	—	4.6	6.4	6.4	—	—	—	17.8	—	6.6	—	10.3	—	—	—
" May ...	"	—	—	—	30.5	—	17.2	—	5.9	5.7	10.4	6.2	—	6.5	4.8	—	—	—	4.9	—	—	—	—	—	—
" June ...	"	—	5.9	5.7	—	—	—	—	—	—	—	—	—	—	—	—	—	4.8	—	—	—	—	—	4.8	6.0
" July ...	"	—	10.9	—	—	—	9.5	—	—	5.8	—	—	—	17.5	—	5.3	—	—	—	—	—	13.8	—	6.7	—
" August ...	"	—	44.6	15.8	22.9	4.7	39.6	6.8	56.2	15.3	21.0	28.7	—	21.5	—	15.3	—	5.5	—	21.4	6.8	—	—	6.1	—
" September ...	"	4.7	11.9	—	7.2	—	5.5	4.8	7.7	22.6	—	—	5.6	—	12.1	16.9	22.2	31.0	16.3	12.5	17.0	6.0	5.2	—	—
1861 April ...	"	—	15.2	—	11.9	6.1	—	4.8	10.2	—	18.2	3.7	8.3	3.3	8.5	4.2	8.3	9.2	3.3	15.1	—	—	—	—	—
" May ...	"	10.7	20.5	6.5	18.8	15.3	15.8	21.7	7.8	19.3	11.7	10.0	24.5	11.8	26.8	16.6	5.1	12.4	18.9	—	12.0	—	—	—	—
" June ...	1.071	—	8.3	—	6.3	—	4.2	—	—	4.7	3.4	—	—	—	7.7	3.4	16.2	3.4	4.1	—	7.8	5.1	5.9	5.0	4.4
" July ...	"	—	3.5	—	5.5	4.2	3.7	—	—	3.5	—	—	—	—	—	—	—	—	4.0	—	—	—	—	—	—
" August ...	"	—	24.0	—	22.5	—	15.7	—	17.5	—	8.9	5.3	—	10.9	—	10.1	—	10.0	—	11.9	—	5.2	—	9.5	—
" September ...	"	—	5.4	—	10.3	—	9.4	—	4.0	—	—	—	—	—	4.2	—	—	7.8	—	13.7	—	—	—	—	—
1862 April ...	"	—	6.9	—	13.7	3.6	7.5	3.4	5.6	3.6	4.4	4.1	3.7	—	—	5.2	—	4.5	—	3.5	—	—	—	—	—
" May ...	"	—	7.7	—	5.6	—	—	3.4	4.5	6.0	4.1	—	—	3.8	—	—	—	12.8	—	—	—	—	—	—	—
" June ...	"	24.0	—	18.3	—	15.4	—	20.3	—	31.8	—	28.3	—	40.3	—	38.0	—	42.5	—	44.7	2.3	46.2	—	26.2	—
" July ...	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" August ...	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" September ...	1.049	15.5	25.2	15.7	27.7	28.7	21.5	8.9	47.8	8.9	39.7	—	21.7	5.7	21.8	7.7	20.7	14.6	23.2	3.1	29.5	9.6	29.1	25.4	31.3

MONTHS.	Val. of a sc. div.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h		
		E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	
		minute.																								
1858 May	0.802	—	—	12.5	—	8.5	5.2	5.2	—	—	—	—	11.6	—	—	—	5.7	5.4	17.0	—	5.3	—	4.7	—	—	—
„ June	„	5.0	—	—	—	7.3	—	15.9	—	16.2	4.7	10.8	9.0	13.8	—	—	11.1	—	12.5	—	19.0	—	—	—	—	—
„ July	„	—	—	—	—	—	—	—	—	—	—	14.5	—	15.3	—	—	5.1	5.3	6.7	—	12.4	4.1	18.4	—	—	—
„ August . . .	„	—	—	5.8	—	—	—	6.5	—	4.9	—	—	—	—	4.6	5.7	—	—	7.7	—	5.3	4.1	15.2	4.9	5.5	—
„ September ..	„	—	—	5.7	—	11.9	—	15.8	—	12.7	5.3	5.4	—	10.2	—	16.4	14.1	15.3	31.3	13.5	19.5	8.0	20.2	4.4	4.6	—
1859 April	„	28.4	—	12.4	—	16.3	—	9.9	4.5	17.0	—	5.2	—	—	9.9	4.3	10.5	4.8	26.3	8.8	18.0	8.3	19.4	4.5	12.0	—
„ May	„	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ June	„	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ July	„	29.2	13.0	26.4	5.5	24.8	11.6	51.1	6.8	29.2	7.0	17.5	6.2	32.4	13.5	28.6	9.0	17.3	16.8	24.1	14.4	8.7	18.0	9.3	9.2	—
„ August . . .	„	3.5	50.3	14.9	17.6	21.8	36.1	24.7	23.9	9.4	22.5	30.1	21.5	42.1	25.4	34.5	25.9	21.2	5.9	23.3	12.5	21.8	5.9	14.8	12.3	—
„ September ..	„	26.1	51.8	21.7	52.8	5.6	75.7	16.3	67.7	32.8	68.6	57.1	64.0	49.4	63.2	48.7	66.6	44.4	70.8	52.1	100.8	48.0	95.0	41.7	66.4	—
1860 April	„	4.0	—	—	—	10.3	—	—	—	10.2	—	6.6	3.5	6.6	10.8	9.8	3.2	—	17.7	—	—	—	11.9	—	3.5	—
„ May	„	—	—	—	5.4	5.1	—	—	—	5.0	—	—	—	—	12.2	—	5.4	5.3	—	—	—	—	5.1	6.0	—	23.7
„ June	„	—	—	—	4.9	—	—	—	—	—	—	—	—	—	5.6	—	—	—	—	—	—	—	5.4	—	10.5	—
„ July	„	6.3	—	—	—	4.6	—	—	—	—	—	9.7	—	—	—	5.6	—	—	28.2	—	15.2	—	22.7	—	21.3	—
„ August . . .	„	—	—	4.8	—	—	—	9.9	5.2	5.8	4.9	8.6	—	6.4	10.3	5.1	25.9	—	12.5	—	18.3	—	28.0	2.5	73.0	—
„ September ..	„	—	—	—	0.7	8.4	—	12.0	1.2	14.4	—	26.8	—	—	—	4.1	15.7	3.9	25.2	—	11.4	—	37.7	—	22.1	—
1861 April	„	—	4.1	3.9	—	17.6	—	13.0	3.4	4.4	4.6	3.3	11.0	—	15.8	2.4	31.4	2.1	44.2	—	21.6	—	13.3	1.4	58.2	—
„ May	„	—	—	—	4.2	—	6.0	—	11.4	—	15.7	5.9	15.7	13.9	24.7	6.2	19.4	3.0	18.5	3.2	21.9	6.8	22.4	12.1	19.0	—
„ June	1.071	—	—	—	3.9	3.5	8.8	—	14.1	—	17.0	—	11.5	—	—	3.5	7.1	4.0	3.8	—	7.1	—	7.1	4.5	17.3	—
„ July	„	—	—	—	—	—	—	—	—	—	—	3.4	—	4.3	—	—	—	—	—	—	3.8	—	8.6	—	—	—
„ August . . .	„	5.8	—	—	—	4.8	—	—	—	—	—	—	—	8.6	—	8.3	6.0	—	8.3	—	15.8	—	18.9	11.8	7.7	—
„ September ..	„	—	—	—	—	3.6	—	4.3	—	5.2	—	—	—	5.6	—	—	—	8.2	—	12.3	10.4	—	7.1	—	—	—
1862 April	„	—	—	—	—	4.4	4.1	6.2	—	14.6	—	13.6	4.1	—	—	—	8.8	—	9.8	—	28.7	—	13.3	—	12.0	—
„ May	„	—	—	—	—	3.6	—	—	—	—	—	—	—	—	—	—	—	8.8	—	—	4.0	5.1	—	—	—	—
„ June	„	23.3	5.9	21.3	10.9	9.5	6.2	23.1	5.4	28.0	—	38.6	—	44.4	—	39.4	—	38.9	7.8	42.5	10.9	40.8	5.7	39.6	11.6	—
„ July	„	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ August . . .	„	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„ September ..	1.049	30.5	32.6	36.3	36.5	46.1	40.0	56.2	18.0	30.0	30.4	37.9	49.7	26.3	40.2	36.2	18.5	28.8	29.1	33.4	40.8	33.6	28.1	20.2	44.7	—

MONTHLY AGGREGATE AMOUNTS OF DISTURBANCE IN MAGNETIC DECLINATION EAST (E.) AND WEST (W.)
IN SCALE DIVISIONS. (1858-1863.)
(Months from October to March.)

MONTHS	Val. of a scale div.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
		E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
1858 October	0.802	—	5.0	—	8.1	—	—	5.0	—	—	—	5.8	—	13.2	—	10.5	5.5	8.1	—	4.7	—	7.4	9.5	12.1	4.2
" November	"	6.7	11.5	11.5	5.1	5.3	10.0	—	4.9	9.1	—	10.7	—	19.7	3.9	13.8	—	14.5	9.6	7.6	4.3	—	4.5	4.9	—
" December	"	78.3	19.4	80.2	15.1	75.5	16.7	86.0	17.6	92.2	20.6	87.2	15.4	90.5	18.4	61.1	21.5	40.9	26.0	47.6	24.2	55.3	2.7	27.8	9.3
1859 January	"	50.5	10.7	40.5	5.2	38.4	10.5	43.4	16.5	31.2	15.8	35.0	14.0	38.7	16.3	36.1	—	23.0	22.4	39.4	34.6	23.5	43.0	10.3	14.1
" February	"	—	26.1	—	30.3	—	41.4	—	34.1	—	18.0	—	10.1	—	19.1	43.0	5.0	5.1	17.6	17.9	34.2	18.8	19.0	12.6	7.9
" March	"	—	24.1	—	21.9	—	19.1	7.0	5.6	—	6.7	—	5.6	—	—	—	—	5.6	5.1	4.5	11.7	14.6	—	—	—
" October	"	3.1	48.0	3.5	58.1	8.0	64.4	—	47.2	—	24.2	7.2	16.1	15.3	9.0	22.3	—	23.0	—	22.1	8.3	14.0	4.4	—	—
" November	"	—	24.9	—	19.8	—	16.2	5.9	5.8	—	—	6.2	5.3	5.0	6.1	11.7	10.0	—	5.1	—	—	10.9	5.0	9.8	21.0
" December	"	—	15.0	—	7.0	—	—	—	6.3	—	20.4	—	6.8	—	10.8	—	20.1	16.8	5.3	17.8	4.4	11.9	22.2	4.6	5.2
1860 January	"	—	—	—	7.2	—	15.8	5.4	6.8	—	10.9	5.8	7.8	6.1	13.3	4.9	6.8	—	6.1	5.5	6.2	5.5	11.5	22.0	9.0
" February	"	—	5.5	—	5.5	—	12.4	—	20.9	—	4.9	11.2	—	8.2	4.8	8.2	9.3	7.1	—	8.5	—	10.1	24.0	—	8.8
" March	"	—	57.5	—	10.7	14.6	6.6	—	5.0	—	16.6	11.5	4.3	14.8	—	30.4	8.7	25.6	4.6	17.7	—	4.6	5.2	—	4.8
" October	"	—	7.1	—	5.5	—	5.5	—	6.1	—	—	—	5.6	—	5.4	11.8	4.8	11.7	—	6.6	—	5.9	—	—	7.0
" November	"	—	9.4	—	4.6	—	10.1	—	4.7	—	10.3	—	—	9.8	—	4.8	—	4.3	—	—	—	13.7	3.7	28.0	3.1
" December	"	—	3.6	—	—	—	—	3.6	—	—	—	—	—	3.9	—	9.3	7.2	4.0	10.0	9.0	31.3	10.8	26.1	11.0	30.0
1861 January	"	—	23.7	—	11.9	—	7.3	—	9.8	6.6	—	—	10.8	4.0	—	3.5	—	9.9	—	11.9	4.7	10.6	19.2	17.0	28.1
" February	"	—	—	—	3.6	—	4.4	—	—	3.4	6.9	7.0	—	—	—	—	—	12.1	3.2	—	—	7.6	—	7.8	—
" March	1.071	—	14.4	3.0	13.3	—	26.6	—	40.6	4.4	14.0	5.1	19.8	3.5	7.2	9.8	3.9	9.2	3.6	9.5	—	3.3	12.0	—	9.2
" October	"	—	19.6	—	13.4	—	7.3	—	13.8	—	11.3	—	4.3	—	—	3.4	8.4	4.3	3.9	7.0	7.7	—	—	—	—
" November	"	—	11.4	—	20.6	—	20.0	—	21.5	5.6	3.9	—	4.3	3.9	—	11.8	6.7	—	4.6	4.7	—	—	—	—	3.9
" December	"	—	15.4	4.2	27.9	—	10.0	—	5.4	16.1	3.7	13.6	16.1	15.3	19.4	13.0	13.7	13.1	3.7	—	—	3.4	3.4	11.1	—
1862 January	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
" February	"	10.1	—	2.8	21.9	—	—	4.2	8.1	7.2	4.3	6.1	13.2	7.6	23.1	4.2	10.3	12.5	5.0	—	5.4	—	10.0	5.2	6.9
" March	"	—	7.6	—	9.3	—	3.7	—	—	—	6.2	—	—	—	—	2.2	—	3.5	—	1.6	—	—	—	—	—
" October	"	8.3	49.7	8.2	29.1	6.1	40.8	2.9	30.7	11.8	13.7	17.2	19.7	27.8	12.2	24.6	15.9	23.1	—	14.7	3.7	6.8	—	4.3	—
" November	"	—	12.5	4.0	15.5	—	16.1	—	19.4	3.3	6.3	—	4.2	16.7	—	—	4.9	—	5.6	—	8.8	—	8.2	—	—
" December	"	—	33.7	9.3	31.2	4.6	30.4	—	22.8	—	16.2	—	17.1	27.4	3.2	15.3	—	15.4	—	16.6	—	20.9	3.7	10.4	5.5
1863 January	"	—	10.0	3.5	22.0	3.4	13.5	3.9	18.7	—	—	4.5	—	29.5	7.2	10.3	10.3	17.7	13.9	25.8	—	3.9	7.3	5.9	5.1
" February	1.049	—	14.5	—	10.6	—	11.0	—	14.0	4.2	3.7	—	—	—	—	11.8	—	24.4	—	4.7	—	—	3.8	—	3.7

MONTHS.			Val. of a sc. div.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h		
				E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	
1858	October	..	Minute 0.802	4.7	12.1	5.6	—	—	—	4.6	—	—	—	—	4.2	10.5	9.5	—	—	12.9	—	—	—	32.4	—	—		
	November	..	"	5.6	14.7	10.1	9.5	4.6	4.5	—	—	—	—	—	5.0	4.5	5.5	7.2	6.9	4.3	6.9	—	6.5	5.4	7.1	7.5		
	December	..	"	35.9	19.4	40.0	3.8	20.2	14.6	20.0	11.2	32.4	14.2	42.1	3.3	56.9	—	66.9	6.0	58.7	17.0	53.8	21.7	57.7	32.4	64.2	24.4	
1859	January	..	"	15.3	23.4	7.4	5.9	20.6	5.0	34.9	—	33.0	23.1	41.5	4.5	24.5	—	42.4	5.7	42.5	5.1	32.8	12.3	62.9	11.4	46.2	11.1	
	February	..	"	6.1	4.9	11.6	—	—	5.5	12.0	—	5.0	—	4.8	15.7	—	17.2	—	30.3	—	17.9	—	15.2	—	11.6	5.3	21.6	
	March	..	"	—	12.1	—	10.5	—	5.1	—	—	5.5	4.5	6.1	—	—	—	14.4	—	16.0	5.3	11.0	3.7	41.3	12.0	8.8		
	October	..	"	5.2	4.8	5.9	11.1	13.0	14.0	15.9	4.8	15.0	5.2	13.3	—	—	7.4	—	12.1	—	6.2	—	27.6	—	32.5	—	7.0	
	November	..	"	9.5	16.4	4.6	5.0	—	—	—	—	—	—	—	—	—	4.7	5.1	—	10.1	—	—	4.0	20.1	—	23.8		
	December	..	"	9.7	10.3	5.2	—	—	5.0	4.7	—	—	—	—	—	—	—	14.2	—	18.6	—	27.8	—	34.1	—	5.2		
1860	January	..	"	—	29.8	4.4	23.8	6.2	23.7	16.1	9.6	4.6	4.8	10.6	—	10.1	9.9	4.9	—	—	—	—	—	21.8	—	2.3		
	February	..	"	—	11.7	—	6.0	4.9	—	—	6.5	5.1	5.4	—	—	—	—	6.2	—	—	—	15.2	—	24.8	—	19.2		
	March	..	"	5.2	18.3	4.6	21.7	—	26.7	12.0	15.5	18.0	4.0	5.0	4.8	7.5	10.1	13.0	15.1	—	19.6	—	41.2	—	34.9	—	31.8	
	October	..	"	6.4	—	15.5	8.5	8.8	5.6	—	5.9	—	—	—	—	—	—	—	—	—	—	25.1	—	—	—	13.9		
	November	..	"	27.6	2.8	33.5	3.5	37.3	10.2	3.8	3.5	—	4.0	—	—	—	—	—	—	—	—	5.1	—	—	6.4	5.6		
	December	..	"	27.3	25.6	24.7	21.5	17.7	26.9	7.5	5.4	—	45.5	—	18.1	—	8.1	—	11.9	—	7.4	3.8	—	3.4	8.8	—	3.8	
1861	January	..	"	23.8	5.2	21.6	3.3	9.5	—	—	23.5	3.8	—	4.6	10.6	3.9	—	—	15.5	—	21.1	—	19.5	—	30.1	—	15.5	
	February	..	"	—	—	3.8	7.4	4.4	4.6	—	4.5	—	9.5	—	—	—	—	—	4.0	—	—	—	14.3	—	13.6	—	24.7	
	March	..	1.071	4.1	3.7	4.2	4.3	—	8.9	—	4.7	—	—	—	—	—	—	—	—	—	17.2	—	4.4	—	13.4	—	9.6	
	October	..	"	—	—	—	—	—	—	3.1	12.4	—	—	—	—	5.0	—	3.6	—	—	—	—	—	—	23.5	—	—	
	November	..	"	—	3.6	—	8.8	6.5	4.0	—	3.5	—	—	—	—	—	4.9	—	4.3	10.1	—	—	3.6	—	21.8	—	4.0	
	December	..	"	8.0	—	3.7	—	—	—	3.8	—	3.6	—	—	—	—	—	—	—	—	5.0	—	—	—	25.8	—	—	
1862	January	..	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
	February	..	"	8.1	4.5	12.9	10.1	10.1	17.2	8.7	3.9	3.8	4.9	4.2	—	4.8	13.0	5.9	—	—	—	4.9	9.1	—	9.7	3.8	9.9	
	March	..	"	4.2	3.6	8.2	5.2	—	—	5.1	—	6.2	—	7.7	—	5.1	—	6.3	—	—	10.3	—	4.1	—	14.2	—	37.9	
	October	..	"	9.3	4.3	6.1	15.2	5.3	7.9	8.4	3.9	5.3	—	4.3	—	11.5	—	—	9.7	—	16.5	—	48.3	—	21.1	—	30.0	
	November	..	"	—	3.9	—	—	—	—	—	—	—	—	—	3.9	—	5.7	—	4.3	—	16.1	—	15.7	—	13.9	4.3	12.7	
	December	..	"	18.6	8.7	12.0	13.3	—	11.4	4.3	—	6.4	4.1	6.7	3.8	10.1	8.3	11.6	7.1	10.1	4.0	—	12.9	3.7	21.1	—	21.4	
1863	January	..	"	10.9	6.3	17.7	10.0	17.8	3.5	17.2	3.1	—	—	—	—	—	—	—	9.6	—	7.2	—	11.8	—	9.1	—	23.3	
	February	..	1.049	6.3	8.0	5.4	14.2	4.0	3.7	7.6	9.2	—	5.3	—	4.6	—	5.3	4.2	4.8	—	21.2	—	17.3	—	9.3	—	7.1	

From the table showing the number of Easterly and Westerly disturbances for each hour, we derive the following results respecting the total number of disturbances in each month:

TABLE SHOWING THE TOTAL NUMBER OF EASTERLY AND WESTERLY DISTURBANCES IN MAGNETIC DECLINATION:

	Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.	
	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
1858	—	—	—	—	—	—	—	—	6	8	16	13	15	14	16	15	32	22	13	16	27	23	173	75
1859	113	50	24	61	9	35	39	31	—	—	—	—	83	72	89	75	148	159	28	46	13	31	13	32
1860	21	36	10	29	24	48	21	18	9	16	4	5	12	8	24	34	21	28	12	18	38	16	31	61
1861	28	43	9	21	13	45	22	59	43	70	9	40	5	6	18	26	8	12	6	21	7	33	19	29
1862	—	—	24	38	10	17	14	22	7	7	82	16	—	—	—	—	125*	139*	34	53	11	21	34	50
1863	30	36	13	33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mean	48.0	41.2	16.0	36.4	14.0	36.2	24.0	32.5	16.2	25.2	27.7	18.5	28.7	25.0	36.7	37.5	52.2	55.2	18.6	30.8	19.2	24.8	54.0	49.4

The values to which an asterisk is attached, and which are apparently far too great, are not reliable, as they were observed in the Absolute House, where sudden changes in the temperature would influence the readings of the instruments in an undue manner.

These values have, therefore, not been included in the general mean for September. Taking this into consideration, the maximum number of disturbances occurred in September, 1859, which was the time of the ever memorable display of the Aurora Australis. In December, 1858, disturbances were likewise very frequent for the same reason.

If we now examine into the distribution of the disturbances among the several hours of the day, we find that

For the period from April to September, the minimum in Easterly disturbance occurs at noon.																								
"	"	October to March,	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	April to September,	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	October to March,	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	April to September, the maximum in Easterly	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	October to March,	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	April to September,	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	October to March,	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
For the whole Year,			the minimum in Easterly			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	"	" " Westerly			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	"	the maximum in Easterly			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"
"	"	"	" " Westerly			"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"	"

We refrain from giving the hourly number of disturbances for the whole year, from which the above values have been derived, as we shall presently have to subjoin a table showing the distribution of the disturbances over the single hours of the day in percentages of the total number of observations, which to some extent replaces the series above referred to.

Dividing the day into two portions, day hours (from 7^h a.m. to 6^h p.m.), and night hours (from 7^h p.m. to 6^h a.m.), we obtain the following mean values:

1858-63.	DAY HOURS.		NIGHT HOURS.	
	Easterly.	Westerly.	Easterly.	Westerly.
April to September	36.2	26.6	38.3	51.8
October to March	40.2	33.1	25.4	51.7
Year.....	76.4	59.7	63.7	103.5

We elicit from the above table that throughout the whole year the *Easterly* disturbances predominate during *the day*, and the *Westerly* during *the night*.

This topic is further illustrated by the following table, in which we find the distribution of the disturbances among the several hours of the day, the hourly values being expressed in percentages of the total number of observations for the respective hours. No distinction is drawn between the disturbances East and West.

1858-63.	MIDN.	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h
	%	%	%	%	%	%	%	%	%	%	%	%
April to September	18.2	17.3	16.0	15.2	15.0	12.1	11.9	14.0	14.0	12.8	11.0	10.0
October to March..	10.0	10.9	9.1	9.6	7.5	8.8	10.3	10.8	9.7	9.6	11.1	9.3
Year.	13.9	13.9	12.4	12.3	11.2	10.4	11.1	12.3	11.7	11.1	11.0	9.6

1858-63.	NOON.	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	8 ^h	9 ^h	10 ^h	11 ^h
	%	%	%	%	%	%	%	%	%	%	%	%
April to September	11.1	10.9	12.9	12.8	12.4	13.7	14.0	14.8	16.1	16.8	17.3	16.6
October to March..	11.1	11.0	9.2	7.1	6.3	4.8	5.1	6.8	6.8	8.1	12.0	10.0
Year.....	11.1	10.9	10.9	9.8	9.2	9.1	9.5	10.6	11.4	12.4	14.6	13.2

We derive from the above table the information that, for the period of the year from April to September, the minimum of the total number of disturbances, no distinction being made with reference to Easterly or Westerly deviation, occurs at 11^h a.m., and the maximum at midnight; for the period from October to March, we find the minimum to take place at 5^h p.m., and the maximum at 10^h p.m.; the average number for the two periods respectively being 14.1 and 9.0. The average number for the year is 10.3 per cent, the extremes occurring at the same time as in the period from October to March.

From the table showing the aggregate amount of disturbances East and West, we derive the subsequent table. The amounts in scale division had for this purpose first to be expressed in minutes, and then a mean taken, paying due regard to the number of observations from which the sum was originally deduced.

TABLE SHOWING THE MEAN AMOUNT OF DISTURBANCES EAST (+) AND WEST (-) IN MAGNETIC DECLINATION, EXPRESSED IN MINUTES.

1858-63.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
April to Sept.	5.1	5.7	4.9	6.3	5.3	6.0	5.0	6.3	5.4	5.8	6.0	5.2	6.6	5.6	6.3	5.7	6.2	5.7	6.4	6.4	6.0	6.7	5.5	6.3
Oct. to March	6.5	6.8	5.8	6.0	6.1	7.1	5.7	6.4	6.2	6.2	5.8	4.9	6.3	4.8	5.9	4.4	6.1	4.6	5.5	4.9	5.2	4.7	4.9	4.7
Year.....	5.6	6.2	5.2	6.1	5.6	6.5	5.3	6.4	5.7	6.0	5.9	5.0	6.4	5.2	6.0	5.0	6.1	5.1	5.9	5.6	5.5	5.3	5.1	5.2

1858-63.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.	E.	W.
April to Sept.	5.2	6.2	5.1	5.3	5.1	5.7	5.9	5.7	5.8	5.8	6.4	6.1	6.0	5.6	5.9	5.7	5.3	6.5	5.3	6.1	4.8	5.8	5.1	6.7
Oct. to March	5.0	4.8	5.1	4.8	4.8	4.9	5.7	4.5	5.3	4.7	5.6	4.4	5.6	5.3	6.6	5.1	6.4	6.0	6.3	6.2	5.2	6.2	5.1	5.9
Year.....	5.1	5.3	5.1	5.0	5.0	5.3	5.8	5.1	5.6	5.3	6.1	5.6	5.9	5.5	6.2	5.4	5.7	6.3	5.6	6.1	5.0	6.0	5.1	6.3

From this table we gather the following with reference to the occurrence of the extremes:

For the period from April to September, the minimum in Easterly disturbance occurs at 10h p.m.

"	"	October to March	"	"	"	"	"	2h p.m.
"	"	April to September	"	"	Westerly	"	"	5h a.m.
"	"	October to March,	"	"	"	"	"	5h and 7h p.m.
"	"	April to September, the maximum in Easterly	"	"	"	"	"	6h a.m.
"	"	October to March,	"	"	"	"	"	7h p.m.
"	"	April to September,	"	"	Westerly	"	"	10h a.m. and 1h p.m.
"	"	October to March,	"	"	"	"	"	2h a.m.
For the year,		the minimum in Easterly		"	"	"	"	2h and 10h p.m.
"	"	" " Westerly		"	"	"	"	5h and 7h a.m. and 1h p.m.
"	"	the maximum in Easterly		"	"	"	"	6h a.m.
"	"	" " Westerly		"	"	"	"	2h a.m.

Dividing the hours of the day into two portions, day hours and night hours, and taking it in the same sense as above explained, we obtain the following amount in minutes:

1858-63.	DAY HOURS.		NIGHT HOURS.	
	Easterly.	Westerly.	Easterly.	Westerly.
April to September	5.82	5.93	5.39	5.97
October to March.....	5.39	4.72	6.00	5.97
Year	5.60	5.27	5.61	5.96

From this we feel disposed to conclude that, for the period from April to September, the mean amount of the disturbance is greatest, when *Easterly*, during the *day hours*; while for *Westerly* disturbance, the greatest mean amount seems to occur in the *night hours*. For the period from October to March the mean amount of disturbance, when both *Easterly* and *Westerly*, is greatest during the night hours. Considering the results for the whole year, we find only with regard to the *Westerly* disturbance, a decided result: that their mean amount is greatest during the night hours, while for the *Easterly* disturbance there seems to exist hardly any difference with regard to day and night.

There can be no doubt that future observations and discussions based thereon will to some extent modify the results arrived at in the present discussion, so as to cause them to be in some cases of a more decisive character; but so much we may already assert, that in the main points these results well ultimately prove to be reliable and in accordance with similar results derived from observations made at other observatories.

MAGNETIC HORIZONTAL FORCE.

22. The limit of disturbance was, in this case, 0.0012 of the horizontal force, as already explained when speaking of the treatment of the observations with a view to determine the final normals. A distinction was drawn with regard to, whether the disturbance caused the horizontal intensity to become larger than the final normal, *i.e.* to increase (+), or whether to become less, *i.e.* to decrease (—). The first two tables give the monthly number of disturbances in horizontal force for months from April to September, and for months from October to March, throughout the whole period of observation. The third and fourth tables contain the monthly aggregate amount of disturbance, expressed in scale divisions, for months from April to September and from October to March respectively.

NUMBER OF DISTURBANCES INCREASING (+) AND DECREASING (—) the **MAGNETIC HORIZONTAL FORCE** THROUGHOUT THE WHOLE PERIOD OF OBSERVATION.

(Months from April to September.)

MONTHS.		MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
		+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1858	May	—	2	—	2	—	—	—	—	1	—	—	—	—	—	—	—	1	1	1	2	1	4	1	2
„	June	—	1	—	1	—	1	—	1	—	—	1	—	2	—	2	—	3	—	3	—	2	1	4	
„	July	—	—	1	—	1	—	1	—	—	—	—	—	—	—	1	—	1	—	1	—	—	—	—	
„	August	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	
„	September ...	—	—	1	—	—	—	—	—	—	—	1	—	1	—	2	—	1	—	4	—	2	—	1	
1859	April	2	3	—	3	1	2	1	3	1	2	1	4	—	5	—	3	—	3	1	4	2	5	2	3
„	May	2	—	—	—	2	1	1	2	1	1	1	2	1	2	1	1	1	1	1	2	1	—	1	—
„	June	—	2	—	2	—	1	1	2	—	3	1	1	1	1	—	—	2	1	2	2	1	—	—	—
„	July	—	1	1	2	—	3	1	1	2	2	2	1	1	2	3	3	3	3	2	4	2	3	3	3
„	August	2	1	4	1	3	1	4	1	3	1	3	1	2	1	1	1	1	1	2	2	—	2	—	3
„	September ...	4	5	8	3	6	3	7	5	8	4	6	7	5	6	7	4	6	4	4	4	3	5	7	3
1860	April	—	1	—	—	—	—	—	1	—	1	—	1	—	1	—	1	1	1	1	2	1	2	3	2
„	May	—	1	—	3	—	—	1	1	—	1	—	—	—	1	—	—	—	1	—	—	—	1	—	1
„	June	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—
„	July	—	7	—	5	1	7	1	6	—	6	—	4	—	4	—	3	—	3	2	4	3	7	3	5
„	August	2	4	2	6	2	5	3	6	2	5	2	5	2	4	1	5	2	5	1	6	1	4	2	3
„	September ...	—	2	—	1	—	2	1	2	1	3	1	2	1	2	—	2	—	2	—	1	—	2	1	2
1861	April	1	1	1	1	1	1	—	1	—	1	—	1	—	1	—	2	—	2	—	1	—	2	—	2
„	May	—	—	—	2	—	3	—	4	—	3	1	2	—	3	—	2	—	5	—	3	—	—	—	2
„	June	5	6	6	6	6	5	7	5	6	5	3	3	5	4	5	5	5	4	5	5	4	4	5	5
„	July	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	—	—	—	1	—	1	—
„	August	—	2	—	3	—	1	—	2	1	2	—	2	—	2	—	2	—	1	—	1	—	1	—	2
„	September ...	1	—	1	—	1	—	—	—	—	1	—	2	1	1	1	1	1	2	1	2	—	2	1	—
1862	April	3	3	2	2	3	1	3	2	2	—	2	3	2	1	3	3	2	3	6	5	4	4	5	6
„	May	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„	June	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
„	July	3	1	3	1	3	1	3	1	2	1	2	1	3	1	1	1	3	1	3	2	3	1	2	1
„	August	—	1	—	1	—	2	—	2	—	1	—	2	—	2	—	2	—	2	—	1	—	2	—	2
„	September ...	—	—	2	1	—	1	—	1	—	—	1	2	—	2	—	3	—	2	—	1	1	2	1	3
Sums... ..		26	45	32	46	30	42	35	49	30	43	27	46	25	49	23	49	27	53	33	62	30	57	39	57

MONTHS.		NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h		
		+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	
1858	May	2	3	2	4	2	4	2	4	1	3	2	3	1	3	—	1	—	—	—	2	—	2	—	2	—
„	June	1	3	—	3	—	2	—	1	—	5	—	3	—	2	—	2	—	4	—	3	—	1	—	—	—
„	July	—	—	—	1	—	2	—	—	—	1	—	1	—	1	—	—	—	—	—	—	—	—	—	—	
„	August	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	
„	September ...	—	1	—	—	—	1	—	—	—	1	1	2	2	2	—	1	—	2	—	1	—	4	1	1	
1859	April	1	4	1	4	2	6	3	5	2	4	2	3	2	4	2	5	2	4	4	4	1	4	1	2	
„	May	1	1	1	1	1	—	1	—	1	—	1	—	2	1	2	2	2	2	—	1	2	2	2	1	
„	June	1	—	2	—	2	1	2	3	1	5	2	3	1	4	2	2	4	2	1	3	2	2	—	—	
„	July	3	3	3	2	4	2	1	3	1	2	—	1	1	1	2	4	—	2	1	2	—	1	—	1	
„	August	2	2	1	3	—	2	1	3	—	2	1	2	—	5	1	2	5	2	3	3	2	2	3	—	
„	September ...	4	5	4	5	5	5	5	5	5	9	6	7	5	6	7	8	5	5	6	4	7	9	3	—	
1860	April	2	3	1	4	2	3	2	—	2	2	—	3	—	2	—	2	—	1	1	1	—	—	—	—	
„	May	—	1	—	1	1	1	—	1	—	1	—	1	—	—	—	—	—	1	—	3	—	2	—	2	
„	June	—	—	—	—	—	—	—	2	—	1	—	2	—	2	—	2	—	2	—	3	—	2	—	2	
„	July	3	4	4	5	3	5	1	5	—	5	—	5	1	5	—	5	—	6	—	6	—	5	—	5	
„	August	1	2	3	3	1	2	—	5	1	4	1	5	2	4	2	6	1	6	2	3	2	5	2	4	
„	September ...	1	3	1	3	1	4	1	3	—	4	—	4	—	3	—	4	—	2	—	3	—	1	—	2	
1861	April	—	1	1	2	1	1	—	3	1	3	—	3	—	4	—	2	—	3	—	2	—	2	—	1	
„	May	—	—	—	1	—	2	—	2	—	2	—	3	—	3	—	3	—	2	—	3	—	—	1	1	
„	June	6	4	5	6	4	6	4	6	3	6	3	6	3	6	6	6	6	5	5	6	5	6	4	6	
„	July	—	—	—	—	—	1	1	—	—	1	—	2	—	—	—	—	—	1	—	—	—	1	—	2	
„	August	—	1	—	2	1	1	1	2	2	2	1	3	1	2	1	3	—	3	—	3	—	3	—	2	
„	September ...	2	1	2	1	1	—	1	3	—	1	1	1	1	2	1	1	—	2	—	1	1	—	—	1	
1862	April	4	3	2	6	3	4	2	4	3	4	4	6	4	6	2	3	2	3	2	5	3	5	2	4	
„	May	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
„	June	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
„	July	3	1	3	1	2	1	1	1	1	2	1	2	2	3	1	3	1	2	1	1	1	1	1	1	
„	August	—	1	—	1	—	2	—	2	—	2	—	2	—	2	—	1	—	2	—	2	—	3	—	2	
„	September ...	2	1	—	4	1	3	1	3	1	1	1	1	—	1	—	—	1	1	—	2	—	1	1	2	
Sums... ..		39	48	36	63	37	62	30	66	24	69	30	73	30	73	23	67	32	66	25	69	23	62	27	47	

NUMBER OF DISTURBANCES INCREASING (+) AND DECREASING (—) THE MAGNETIC HORIZONTAL
FORCE THROUGHOUT THE WHOLE PERIOD OF OBSERVATION.

(Months from October to March.)

MONTHS.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
1858 October ...	—	1	—	1	1	1	—	1	—	1	—	2	1	1	—	1	1	2	—	—	1	2	—	2
„ November ...	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—	1	1	2	—	3	1	1	2	1
„ December ...	1	3	1	2	2	2	2	1	1	1	2	2	2	2	3	1	2	2	2	2	4	1	5	2
1859 January ...	2	1	4	—	2	—	2	—	2	1	4	1	3	—	4	1	2	1	2	2	1	1	—	2
„ February ...	—	3	—	4	—	2	—	—	—	—	2	1	1	2	1	3	1	4	—	3	—	—	1	1
„ March ...	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
„ October ...	3	6	3	5	7	4	5	4	3	4	7	3	5	4	6	3	3	5	4	2	3	3	2	3
„ November ...	—	—	—	—	—	3	—	3	1	1	—	1	—	1	—	3	—	2	—	3	—	2	—	2
„ December ...	—	3	—	3	1	5	1	5	—	2	1	2	—	4	—	4	1	4	2	7	—	3	—	4
1860 January ...	—	—	2	—	—	—	—	—	—	—	—	—	1	—	—	—	2	—	3	—	1	1	1	1
„ February ...	—	—	1	—	1	1	—	1	—	2	—	—	—	—	—	1	—	1	—	3	1	3	1	2
„ March ...	1	2	—	3	—	2	—	2	—	3	1	2	1	2	2	2	1	2	1	2	2	2	2	3
„ October ...	—	1	—	2	—	—	—	1	1	1	—	1	—	—	—	—	1	—	—	—	—	—	1	—
„ November ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	1	1
„ December ...	—	2	—	1	—	2	—	2	—	2	—	3	—	3	1	3	1	3	1	2	3	4	5	2
1861 January ...	—	2	1	1	—	3	—	1	1	2	1	2	1	5	—	4	2	4	1	3	3	6	1	6
„ February ...	—	1	—	1	—	1	1	2	—	2	—	1	—	2	—	—	—	2	1	1	1	1	1	2
„ March ...	—	2	1	3	—	6	—	3	—	3	—	4	—	4	—	2	—	1	1	—	1	5	1	4
„ October ...	1	2	—	3	—	2	—	3	1	1	1	2	1	2	1	2	—	3	—	3	—	4	1	3
„ November ...	3	3	—	2	1	1	1	1	1	2	2	1	2	2	2	2	—	3	3	2	3	2	2	2
„ December ...	1	4	2	3	—	3	1	2	1	2	1	2	1	4	4	4	5	5	5	5	5	5	6	6
1862 January ...	3	7	2	7	2	7	2	5	4	6	1	7	3	8	2	8	1	4	2	5	—	5	3	6
„ February ...	—	—	—	1	—	1	—	1	—	2	—	1	—	2	1	2	3	2	3	2	3	1	3	—
„ March ...	5	5	4	3	4	4	4	1	4	2	5	—	4	—	5	1	6	3	4	4	6	5	7	5
„ October ...	2	4	1	4	1	4	1	3	1	1	2	4	1	2	1	5	1	3	1	2	—	3	1	1
„ November ...	1	3	4	3	—	8	—	9	1	7	1	4	1	8	1	2	—	4	1	5	2	4	1	7
„ December ...	3	6	2	9	3	7	2	5	3	7	1	5	5	7	4	4	5	5	4	4	5	4	4	4
1863 January ...	3	2	5	—	4	4	6	3	4	3	8	3	6	4	6	4	5	4	2	4	3	7	6	4
„ February ...	2	—	2	—	2	1	1	—	1	—	2	—	1	1	2	1	2	1	2	—	3	—	2	2
Sums ...	32	64	36	63	31	74	29	60	30	58	41	54	40	70	45	66	45	73	46	69	52	75	60	78

MONTHS.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
1858 October ...	—	1	—	1	—	—	—	—	—	1	1	1	—	2	—	3	—	1	—	2	—	3	—	3
„ November ...	3	2	3	2	2	2	1	2	1	1	—	—	—	—	—	—	—	2	—	1	—	2	—	1
„ December ...	4	2	6	3	4	4	5	3	6	3	3	1	3	—	2	—	3	1	2	1	2	1	2	1
1859 January ...	—	3	2	—	—	1	—	2	—	—	2	1	1	1	3	—	2	—	2	—	2	1	2	1
„ February ...	1	1	1	2	1	3	1	3	1	2	1	2	1	1	—	1	—	1	—	3	—	2	—	1
„ March ...	—	—	—	1	1	2	—	—	—	1	—	1	—	—	—	—	1	—	—	—	—	—	2	—
„ October ...	2	3	3	3	3	3	1	4	2	4	2	2	2	3	2	2	2	3	2	2	3	5	1	4
„ November ...	—	1	—	1	—	2	—	3	—	2	—	2	1	1	—	1	—	1	—	1	1	1	—	1
„ December ...	—	2	3	2	2	2	1	2	—	2	—	1	—	—	1	1	1	1	1	3	—	3	—	3
1860 January ...	—	—	—	1	—	—	1	1	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	1
„ February ...	—	2	—	3	—	1	—	—	—	1	—	2	—	1	—	—	—	1	—	2	—	—	—	2
„ March ...	—	3	—	3	1	3	3	4	3	3	1	3	—	3	1	4	1	4	2	4	—	3	3	5
„ October ...	—	1	—	—	—	—	—	—	1	1	—	1	—	—	1	—	—	—	—	—	—	—	—	3
„ November ...	—	2	—	1	—	1	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
„ December ...	4	3	4	4	—	3	3	4	1	5	1	1	—	1	—	3	1	3	—	2	—	2	—	2
1861 January ...	5	7	4	7	4	5	2	5	3	3	—	4	1	4	1	3	—	1	1	4	1	2	2	2
„ February ...	2	3	1	2	1	2	1	—	—	—	—	2	—	3	—	4	1	2	1	2	—	1	1	1
„ March ...	—	4	—	2	—	2	1	3	1	2	—	3	1	2	1	3	1	2	1	1	1	3	1	3
„ October ...	—	4	2	3	2	4	3	2	2	4	1	2	1	2	1	1	1	2	—	2	2	2	—	3
„ November ...	—	2	—	2	1	1	—	3	2	3	1	1	1	1	1	1	2	3	3	2	—	2	4	2
„ December ...	5	6	6	6	4	3	3	2	3	2	1	3	1	4	4	4	2	3	3	4	1	2	3	4
1862 January ...	3	5	3	5	3	6	4	4	4	5	3	5	4	8	2	5	1	8	2	8	3	7	2	6
„ February ...	1	2	2	—	2	3	1	2	—	3	—	2	—	2	—	2	—	2	—	2	1	2	—	1
„ March ...	7	5	6	4	5	4	5	4	4	5	4	6	4	4	4	4	5	3	4	4	4	3	5	3
„ October ...	1	2	—	2	1	2	3	3	3	6	—	7	1	7	—	5	—	3	1	4	—	2	—	2
„ November ...	1	5	1	1	1	1	1	2	—	3	—	6	2	3	4	3	2	3	2	2	1	2	1	5
„ December ...	2	5	4	5	5	4	5	5	5	5	5	7	5	8	6	4	5	5	4	6	3	9	4	5
1863 January ...	6	6	6	5	6	5	4	6	7	5	8	5	8	4	6	2	6	2	5	3	5	3	4	3
„ February ...	4	1	2	—	3	1	1	1	1	2	1	—	2	2	1	1	3	—	1	1	1	—	3	—
Sums ...	51	82	60	71	52	70	50	71	50	74	35	72	39	67	41	60	40	59	37	64	33	65	38	69

MONTHLY AGGREGATE AMOUNTS OF DISTURBANCE, INCREASING (+) AND DECREASING (—) THE **MAGNETIC HORIZONTAL FORCE**.
IN SCALE DIVISIONS. (1858—1863.)
(Months from April to September.)

MONTHS.		Val. of a sc. div.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h			
			+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
		0-000																										
1858	May	1-49	—	19 0	—	19 3	—	—	—	9 3	—	—	—	—	—	—	—	8 7	13 5	9 8	19 9	9 7	48 3	11 4	30 6			
"	June	"	—	9 6	—	9 8	—	12 2	—	8 5	—	—	—	9 6	—	22 1	—	23 1	—	32 1	—	38 2	—	28 0	—	59 4		
"	July	"	—	—	8 4	—	9 0	—	8 9	—	—	—	—	—	—	—	—	8 4	—	15 3	—	19 0	—	—	—			
"	August . . .	"	8 2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10 7	—	—	—			
"	September ..	"	—	—	8 6	—	—	—	—	—	—	—	—	8 4	—	9 0	—	19 7	—	11 5	—	40 7	23 2	—	—	12 4		
1859	April	"	16 8	45 5	—	44 3	7 9	21 4	6 8	43 6	7 6	28 8	6 9	54 8	—	64 6	—	54 4	—	59 5	6 4	62 2	13 2	94 2	15 5	52 7		
"	May	"	18 5	—	—	—	21 7	8 4	9 7	17 5	10 4	10 1	8 8	20 3	8 6	22 4	8 0	4 4	8 7	10 9	9 5	24 0	10 6	—	10 7	—		
"	June	"	—	23 3	—	22 6	—	13 3	7 6	19 0	—	31 3	8 5	10 5	8 5	11 5	—	—	17 0	9 5	17 7	23 5	8 5	—	—	—		
"	July	"	—	22 3	11 7	33 2	—	39 0	10 1	15 5	17 3	23 1	23 7	8 0	12 4	19 7	26 0	34 3	29 5	38 3	19 6	57 3	22 6	36 4	36 0	35 7		
"	August.. . .	"	9 4	60 2	36 1	38 9	27 9	24 3	36 8	31 7	33 4	26 1	29 1	24 3	18 7	22 7	10 5	22 0	9 6	21 2	27 5	90 6	—	52 5	—	71 9		
"	September ..	"	44 1	60 3	87 4	92 4	70 1	65 6	70 4	97 5	86 8	98 0	47 6	130 0	42 8	101 8	77 9	70 0	57 5	64 6	28 5	80 8	24 6	68 2	72 8	43 8		
1860	April	"	—	8 9	—	—	—	—	—	9 3	—	15 9	—	10 0	—	—	11 2	—	12 0	8 8	9 7	7 8	21 2	7 7	21 8	29 6	20 2	
"	May	"	—	10 8	—	30 1	—	—	—	8 3	—	11 4	—	—	—	10 7	—	—	—	10 6	—	—	—	8 3	—	15 7		
"	June	"	—	—	—	—	—	8 5	—	—	—	—	—	—	—	—	—	—	—	—	—	8 7	—	9 1	—	—		
"	July	"	—	97 8	—	84 3	6 0	100 9	5 5	86 2	—	87 0	—	62 2	—	48 8	—	27 0	—	33 7	14 6	58 2	31 3	103 6	25 2	89 5		
"	August . . .	"	46 3	69 6	17 7	111 0	54 4	98 5	18 7	113 5	15 4	97 7	14 4	128 9	15 8	98 0	8 2	107 5	16 0	94 7	8 8	117 9	7 5	62 0	15 6	51 5		
"	September ..	"	—	28 8	—	12 4	—	44 5	7 8	45 1	7 7	47 1	7 9	31 5	10 9	33 0	—	47 0	—	35 8	—	21 2	—	24 2	—	26 7		
1861	April	1 93	6 5	12 4	6 1	14 5	5 9	13 9	—	12 1	—	8 6	—	17 1	—	10 2	—	19 5	—	26 4	—	24 9	—	24 3	—	22 8		
"	May	"	—	—	—	17 8	—	25 6	—	32 9	—	25 4	7 6	16 3	—	23 6	—	19 9	—	43 9	—	21 9	—	—	—	18 2		
"	June	1-84	26 2	106 3	36 6	103 7	36 7	91 6	42 0	89 1	37 8	87 9	19 7	52 5	38 0	62 1	29 1	81 5	36 5	66 8	31 1	84 7	26 3	74 1	30 2	90 0		
"	July	"	—	6 8	—	—	—	—	—	—	—	8 5	—	—	—	—	—	—	11 6	—	—	—	7 0	—	6 7			
"	August.. . .	"	—	32 9	—	52 2	—	14 4	—	24 6	6 2	18 2	—	16 1	—	17 9	—	18 7	—	9 0	—	10 6	—	12 3	—	27 2		
"	September ..	"	8 9	—	8 4	—	8 2	—	—	—	—	—	6 7	—	16 7	7 1	7 0	6 6	—	7 1	14 6	11 3	16 7	—	17 0	6 9		
1862	April	"	25 6	25 3	19 4	15 9	22 4	7 0	25 0	13 0	19 8	—	20 1	25 2	19 0	10 3	24 2	32 7	13 8	37 6	42 1	62 2	43 0	69 9	36 4	92 9		
"	May	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
"	June	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
"	July	"	59 3	36 2	60 9	35 2	116 9	25 6	66 3	36 0	47 6	34 4	40 8	34 0	52 2	33 2	16 8	34 7	42 7	29 8	32 7	40 8	48 0	27 5	34 6	10 3		
"	August . . .	"	—	13 3	—	17 5	—	29 4	—	28 6	—	11 8	—	24 1	—	25 3	—	31 7	—	28 2	—	13 4	—	34 1	—	48 7		
"	September .	1-80	—	—	34 0	6 4	—	8 6	—	11 6	—	—	16 6	20 6	—	18 6	—	31 6	—	17 0	—	8 3	6 4	16 1	7 6	25 0		

MONTHS.		Val. of a sc. div.	NOON.		1 ^h		2 ^h		3 ^h		4 ^h		5 ^h		6 ^h		7 ^h		8 ^h		9 ^h		10 ^h		11 ^h			
			+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
		0 ⁰⁰⁰																										
1858	May	1 ⁴⁹	23.2	39.2	18.7	49.5	14.6	43.9	16.1	52.5	7.7	49.0	16.3	71.1	7.2	33.5	—	20.6	—	—	—	20.7	—	19.5	—	19.1		
"	June	"	9.4	32.6	—	33.7	—	25.0	—	12.1	—	60.3	—	34.5	—	31.5	—	34.0	—	45.7	—	35.7	—	9.7	—	—		
"	July	"	—	—	—	8.6	—	23.4	—	—	—	11.3	—	18.6	—	9.0	—	—	—	—	—	—	—	—	—	—		
"	August . . .	"	—	—	—	—	—	9.1	—	—	—	—	—	—	—	—	—	—	—	8.7	—	—	—	—	—	—		
"	September ..	"	—	9.7	—	—	—	9.8	—	—	—	8.3	10.8	19.5	22.6	21.3	—	15.0	—	25.8	—	9.1	—	11.7	10.2	8.6		
1859	April	"	9.2	52.2	8.0	66.6	13.8	90.1	19.7	75.0	15.7	48.7	13.8	53.0	15.6	64.4	14.3	78.4	12.2	77.8	28.6	72.5	6.4	76.0	7.2	38.8		
"	May	"	8.5	9.1	8.7	8.8	11.2	—	11.5	—	11.8	—	12.8	—	22.6	11.1	19.6	18.2	18.7	18.0	—	9.0	25.7	19.4	20.1	8.1		
"	June	"	8.4	—	18.4	—	17.8	19.2	16.3	33.0	7.9	54.5	16.6	46.7	6.7	53.4	21.1	18.0	35.7	19.4	8.0	29.9	17.4	19.6	—	—		
"	July	"	26.6	35.0	33.8	21.6	41.8	20.8	11.0	28.7	8.2	19.5	—	8.4	9.9	10.4	16.5	65.7	—	30.3	8.0	34.7	—	25.6	—	20.3		
"	August . . .	"	13.2	74.3	8.9	52.2	—	27.6	5.4	93.1	—	21.7	11.7	41.8	—	59.3	15.7	18.7	50.3	75.9	28.6	64.4	17.1	41.2	30.6	—		
"	September ..	"	36.1	78.9	39.7	75.6	45.1	67.1	45.4	70.6	45.1	82.8	84.6	101.2	67.8	73.4	58.7	132.2	85.5	89.4	44.3	93.6	39.4	82.0	102.3	78.7		
1860	April	"	16.1	39.2	8.2	44.9	16.0	38.3	20.2	—	17.5	19.7	—	29.6	—	23.6	—	23.8	—	4.1	10.5	11.0	—	—	—	—		
"	May	"	—	11.7	—	11.5	9.4	11.1	—	9.8	—	14.2	—	12.5	—	—	—	—	—	10.7	—	36.0	—	20.6	—	19.6		
"	June	"	—	—	—	—	—	—	—	22.6	—	9.6	—	32.8	—	37.0	—	38.6	—	37.9	—	50.6	—	31.9	—	28.2		
"	July	"	26.5	56.4	29.8	87.6	21.0	78.2	7.0	71.8	—	61.2	—	70.5	6.9	62.6	—	79.5	—	76.2	—	98.3	—	92.4	—	88.4		
"	August . . .	"	9.0	45.7	32.0	36.5	9.2	24.6	—	57.7	14.7	53.9	6.7	63.4	14.1	64.4	13.3	66.4	7.5	79.6	29.5	42.1	12.1	96.0	17.5	69.9		
"	September ..	"	7.4	50.7	8.3	34.9	5.9	73.9	6.9	46.2	—	64.1	—	66.4	—	80.5	—	80.1	—	35.6	—	63.8	—	18.2	—	52.6		
1861	April	1 ⁹³	—	16.0	10.0	22.3	6.3	14.4	—	30.7	5.8	29.3	—	30.0	—	28.8	—	21.0	—	32.0	—	19.1	—	18.7	—	7.0		
"	May	"	—	—	—	6.4	—	16.1	—	14.2	—	17.7	—	29.2	—	25.1	—	24.6	—	15.5	—	22.6	—	—	6.6	7.9		
"	June	1 ⁸⁴	44.9	71.3	32.6	98.9	24.4	102.3	25.2	99.1	21.9	93.4	16.7	85.3	19.9	103.3	36.4	96.4	35.6	88.5	33.2	96.0	31.0	95.1	19.8	100.7		
"	July	"	—	—	—	—	6.6	7.3	9.8	—	—	7.2	—	16.8	—	—	—	—	—	7.9	—	—	—	9.6	—	19.5		
"	August . . .	"	—	17.6	—	16.0	11.2	6.4	12.7	18.9	13.8	19.5	6.1	30.3	7.1	18.7	6.5	32.6	—	33.2	—	29.7	—	37.9	—	24.9		
"	September ..	"	18.9	8.3	17.9	7.7	7.4	—	6.5	25.8	—	9.0	13.8	9.2	13.1	9.8	6.7	12.5	—	13.9	—	6.9	10.6	—	—	7.0		
1862	April	"	32.4	61.2	12.8	84.2	17.4	68.6	12.4	54.5	14.0	56.9	24.3	87.7	19.4	98.0	13.4	44.2	14.2	36.8	10.7	81.6	15.7	79.2	13.0	65.2		
"	May	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
"	June	"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
"	July	"	59.5	8.9	56.8	13.1	37.7	11.5	28.5	13.2	17.3	29.4	10.9	29.4	21.8	68.6	13.2	65.3	14.3	50.7	16.4	35.8	15.6	38.2	15.9	38.1		
"	August . . .	"	—	25.1	—	31.4	—	39.9	—	32.9	—	32.6	—	34.2	—	35.8	—	26.9	—	31.0	—	35.0	—	51.0	—	25.6		
"	September ..	1 ⁸⁰	19.6	7.0	—	16.0	9.0	27.4	7.9	14.7	7.0	11.8	7.8	7.7	—	11.2	—	—	10.1	7.0	—	16.5	—	15.7	10.8	21.3		

MONTHLY AGGREGATE AMOUNTS OF DISTURBANCE, INCREASING (+) AND DECREASING (—) THE MAGNETIC HORIZONTAL FORCE.

IN SCALE DIVISIONS. (1858-1863.)

(Months from October to March.)

MONTHS.	Val. of a sc. div.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
		+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1858 October	0.000	—	8.7	—	9.3	14.4	10.7	—	11.1	—	11.1	—	20.4	8.3	10.4	—	10.2	8.4	21.7	—	—	7.2	36.0	—	20.8
„ November	1.49	9.7	10.1	—	11.2	—	—	—	—	—	—	—	—	—	—	—	9.4	7.6	20.3	—	28.1	8.2	9.5	20.4	10.6
„ December	„	8.3	38.4	8.1	26.6	18.6	29.4	19.9	29.0	12.9	16.9	13.2	21.9	23.3	22.6	18.9	35.2	9.5	16.8	16.5	28.3	37.0	18.3	65.4	25.5
1859 January	„	22.1	14.3	43.9	—	22.5	—	23.5	—	25.0	10.4	41.5	7.5	35.9	—	46.4	6.7	26.0	8.1	23.7	30.6	10.0	9.5	—	17.9
„ February	„	—	32.3	—	55.5	—	34.7	—	—	—	—	18.2	14.2	9.4	24.4	10.2	30.8	12.7	40.8	—	26.7	—	—	11.3	24.4
„ March	„	—	—	9.7	8.0	—	—	—	—	—	—	—	—	—	—	—	—	8.9	—	—	—	—	—	—	—
„ October	„	22.8	114.2	20.4	93.3	51.5	121.3	31.4	122.7	19.9	91.9	52.7	110.9	36.1	107.0	51.6	87.0	22.1	111.1	36.4	55.1	26.4	64.4	17.0	65.2
„ November	„	—	—	—	—	—	41.2	—	32.6	9.1	9.4	—	10.2	—	9.5	—	36.3	8.1	25.6	—	38.6	—	27.0	—	28.6
„ December	„	—	53.5	—	53.4	7.4	69.5	6.7	66.3	—	20.6	8.7	33.3	—	43.9	—	51.9	7.4	54.6	11.3	87.3	—	44.0	—	53.2
1860 January	„	—	—	19.6	—	—	—	—	—	—	—	—	—	9.6	—	—	—	18.8	—	20.8	—	10.9	9.3	10.4	15.0
„ February	„	—	—	9.2	—	9.0	8.4	—	8.6	—	20.2	—	—	—	—	—	10.1	—	14.8	—	41.5	7.6	32.2	9.8	22.1
„ March	„	6.5	61.5	—	60.0	—	28.6	—	47.3	—	44.2	7.7	42.2	7.3	28.9	15.4	34.6	9.4	35.4	7.5	28.8	16.0	33.3	17.0	46.0
„ October	„	—	14.7	—	23.3	—	—	—	9.2	10.0	9.0	—	12.0	—	—	—	—	9.4	—	—	—	—	—	15.6	—
„ November	1.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8.8	—	—	—	—	7.7	10.0
„ December	„	—	14.6	—	6.8	—	15.8	—	17.2	—	16.9	—	34.9	—	22.7	5.8	26.9	6.6	35.1	7.9	32.6	29.2	42.8	36.3	18.6
1861 January	„	—	23.9	6.2	10.9	—	24.9	—	7.2	11.3	16.0	7.8	16.0	8.8	47.2	—	44.3	11.4	51.3	7.5	38.6	16.3	72.9	6.6	72.4
„ February	„	—	6.9	—	7.3	—	7.3	6.4	14.2	—	14.7	—	7.9	—	14.0	—	—	—	16.2	10.8	10.1	6.2	6.3	7.1	15.0
„ March	„	—	19.4	6.0	25.2	—	50.3	—	23.7	—	22.2	—	28.4	—	33.2	—	18.2	—	9.6	6.5	—	6.0	38.9	6.5	38.1
„ October	1.84	8.2	22.7	—	23.2	—	20.8	8.2	16.3	6.5	8.2	6.2	18.2	6.2	21.4	5.9	27.0	—	33.6	—	33.5	—	41.3	5.9	30.9
„ November	„	22.2	21.4	—	14.7	8.1	6.9	6.6	8.1	7.2	16.2	14.2	8.1	14.3	18.6	13.3	16.6	—	24.7	22.0	16.6	23.3	15.9	13.6	14.4
„ December	„	5.7	32.5	16.4	26.7	—	24.5	7.0	15.7	8.0	17.6	8.2	22.6	8.9	48.1	28.5	55.2	38.1	62.5	48.6	59.6	42.9	57.9	51.6	112.8
1862 January	„	27.0	88.6	23.4	69.9	25.3	74.3	25.5	69.9	37.5	73.0	15.8	74.4	30.5	84.6	18.9	90.1	10.9	32.4	23.3	55.5	—	45.3	21.4	58.2
„ February	„	—	—	—	7.1	—	6.7	—	7.5	—	9.1	—	8.7	—	19.4	6.4	20.7	25.3	14.7	21.4	12.9	24.6	7.6	26.1	—
„ March	„	46.2	35.8	36.8	22.5	32.6	28.9	37.7	5.4	34.3	11.7	43.1	—	37.6	—	47.7	6.1	59.3	22.3	36.7	31.7	61.0	77.4	72.4	52.8
„ October	1.80	13.3	57.7	5.3	53.7	6.2	47.8	7.6	30.9	7.6	13.6	13.1	55.9	9.1	24.6	5.2	71.4	5.6	41.5	6.8	26.3	—	34.6	8.4	8.7
„ November	„	13.8	26.6	40.8	31.5	—	77.1	—	89.4	6.0	68.9	7.5	33.8	5.9	68.8	6.7	15.7	—	33.9	5.4	45.1	15.5	62.2	8.2	65.2
„ December	„	20.6	60.6	15.7	86.3	26.2	77.1	16.3	48.8	18.9	67.8	7.7	71.9	32.8	94.6	29.9	74.1	33.8	90.3	25.1	85.7	33.4	84.4	26.5	79.6
1863 January	„	32.8	16.6	48.5	—	34.0	38.6	53.8	17.0	40.9	25.9	83.0	24.8	57.5	29.8	55.8	34.0	53.5	34.7	21.3	42.9	22.8	72.6	56.3	43.1
„ February	„	23.8	—	20.6	—	17.7	10.5	13.2	—	13.5	—	21.0	—	12.5	6.9	19.4	14.9	23.8	15.0	18.2	—	25.6	—	17.6	14.8

MONTHS		Val. of a sc. div.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
			+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
		0.000																								
1858	October	1.49	—	10.5	—	18.0	—	—	—	—	14.8	11.5	12.3	—	25.2	—	35.8	—	14.0	—	28.0	—	29.0	—	28.8	
"	November	"	30.0	21.1	29.4	19.4	18.3	20.6	9.1	18.4	8.1	9.4	—	—	—	—	—	18.3	—	11.0	—	19.2	—	10.3		
"	December	"	49.2	23.2	65.2	25.8	41.2	38.2	54.5	23.1	67.0	31.6	28.2	12.4	26.3	—	18.1	—	28.4	8.0	17.2	10.3	18.3	8.7	17.5	10.4
1859	January	"	—	39.1	22.3	—	—	10.5	—	21.8	—	—	22.3	11.1	10.6	8.0	26.8	—	17.9	—	18.3	—	21.0	7.9	26.4	10.3
"	February	"	10.1	13.5	8.2	17.2	7.9	29.9	7.9	36.2	9.1	20.4	8.4	20.1	8.0	9.1	—	18.2	—	15.6	—	41.9	—	26.5	—	9.5
"	March	"	—	—	—	8.8	9.3	18.0	—	—	—	9.3	—	11.4	—	—	—	8.5	—	8.7	—	—	—	—	16.3	—
"	October	"	18.9	59.6	28.4	36.0	25.1	53.3	8.0	61.3	15.0	62.3	16.2	34.9	17.7	42.0	18.5	43.7	17.0	46.2	17.5	26.6	19.9	91.5	6.9	70.5
"	November	"	—	17.4	—	13.5	—	28.5	—	38.3	—	19.9	—	19.5	8.7	11.4	—	13.2	—	13.9	—	14.7	8.7	12.0	—	12.8
"	December	"	—	32.3	26.2	35.4	26.3	35.9	7.7	31.3	—	19.4	—	10.0	—	—	8.5	9.4	8.9	11.6	7.2	37.3	—	46.3	—	51.9
1860	January	"	—	—	—	9.0	—	—	12.7	8.8	—	—	—	8.7	—	—	—	—	—	—	13.4	—	—	—	—	11.7
"	February	"	—	23.9	—	33.9	—	18.4	—	—	—	13.7	—	22.3	—	13.2	—	—	—	14.3	—	21.2	—	—	—	27.9
"	March	"	—	49.4	—	51.3	6.9	52.0	29.9	51.6	28.3	33.8	6.8	47.3	—	41.4	6.2	64.9	6.2	88.1	15.2	81.2	—	70.3	21.3	74.1
"	October	"	—	—	8.5	—	—	—	—	—	8.9	7.9	—	9.9	—	—	11.2	—	8.9	—	—	—	—	—	—	30.4
"	November	1.93	—	14.7	—	9.9	—	17.5	—	8.1	—	—	—	—	—	—	—	8.5	—	—	—	—	—	—	—	—
"	December	"	27.3	21.9	34.1	27.5	—	23.4	20.3	32.2	5.5	36.6	6.3	10.5	—	10.6	—	37.6	5.3	34.9	—	21.7	—	18.7	—	19.0
1861	January	"	28.3	84.9	24.1	81.5	26.7	58.6	13.4	52.8	20.6	39.5	—	42.8	6.1	55.1	7.7	33.7	—	7.4	5.6	40.0	6.7	19.1	13.0	21.2
"	February	"	11.9	25.3	6.8	14.3	6.6	13.5	6.6	—	—	—	—	13.6	—	21.8	—	31.5	6.4	16.2	6.6	16.1	—	7.0	6.2	7.6
"	March	"	—	41.4	—	25.9	—	18.9	5.9	25.3	7.3	17.0	—	21.6	10.5	18.7	9.0	24.5	6.8	22.3	6.2	7.6	7.5	26.5	6.5	25.9
"	October	1.84	—	43.5	12.7	24.8	13.8	32.6	22.7	18.1	17.9	37.8	6.1	19.6	11.6	13.4	10.9	8.3	6.3	18.6	—	18.5	16.3	20.1	—	36.5
"	November	"	—	18.0	—	17.7	10.2	7.8	—	25.2	14.8	30.8	6.8	7.5	8.7	7.9	7.5	17.0	22.0	22.5	14.4	—	12.8	31.2	13.5	20.6
"	December	"	44.1	70.6	49.8	72.7	34.9	37.5	23.4	29.0	20.2	28.2	8.0	33.8	8.2	41.1	25.3	42.2	12.6	27.3	18.4	35.3	10.5	18.2	18.3	34.6
1862	January	"	28.2	45.5	30.7	41.4	28.3	61.7	36.8	46.5	45.3	43.0	33.6	57.7	33.2	103.0	26.4	47.1	17.2	86.7	21.7	83.3	31.3	77.8	25.6	71.6
"	February	"	10.1	15.8	15.9	—	15.6	20.9	8.0	17.5	—	27.2	—	18.5	—	15.9	—	16.1	—	14.7	—	17.3	6.3	13.8	—	6.7
"	March	"	66.3	53.9	59.5	40.2	46.2	32.4	43.8	34.2	60.6	43.2	31.5	45.3	31.8	28.5	34.6	31.0	42.4	24.5	36.9	34.0	38.0	24.1	45.4	20.0
"	October	1.80	6.3	21.3	—	16.9	7.7	28.2	21.8	40.0	16.4	85.4	—	88.4	7.6	91.8	—	69.9	—	51.6	6.9	69.1	—	31.3	—	21.4
"	November	"	8.4	45.5	6.6	9.1	7.8	11.0	6.6	18.1	—	26.2	—	53.6	20.1	25.5	32.9	22.9	14.2	27.1	14.8	17.5	10.9	18.8	5.8	45.2
"	December	"	13.3	58.5	26.3	74.2	39.3	54.8	40.0	58.6	37.4	54.5	42.7	78.9	40.4	84.8	66.4	34.5	41.2	57.2	32.0	69.7	29.8	97.9	31.6	53.8
1863	January	"	58.0	66.0	57.7	58.7	62.4	44.2	41.1	61.2	73.8	39.0	92.8	39.1	93.1	27.4	65.9	15.1	67.8	18.0	49.2	27.5	54.1	27.1	47.7	23.0
"	February	"	36.9	6.3	17.7	—	30.0	7.8	10.9	9.6	14.3	13.8	9.3	—	18.4	18.2	13.2	8.3	29.3	—	13.9	7.2	13.2	—	31.2	—

From the tables referring to the *number* of disturbances we derive the following results:

TABLE SHOWING THE MONTHLY NUMBER OF INCREASING AND DECREASING DISTURBANCES FOR THE WHOLE PERIOD OF OBSERVATION.

	Jan.		Feb.		March.		April.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.	
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1858	—	—	—	—	—	—	—	—	17	44	2	50	3	9	2	2	5	28	5	33	15	25	66	44
1859	44	20	13	45	4	9	34	89	29	23	28	40	36	52	44	44	142	117	76	84	3	38	15	68
1860	12	6	4	29	26	69	16	34	2	24	—	21	22	122	40	107	9	59	6	12	2	7	25	62
1861	35	86	12	38	12	67	6	43	2	51	116	126	1	13	8	48	23	19	21	61	35	48	68	88
1862	59	147	20	38	115	82	69	86	—	—	—	—	49	32	—	42	13	38	23	81	29	100	94	135
1863	129	91	45	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mean	55.8	70.0	18.8	33.0	39.2	56.7	31.2	63.0	12.5	35.5	48.7	59.2	22.2	45.6	23.5	48.6	38.4	52.2	26.2	54.2	16.8	43.6	53.6	79.4

Note: — During January, 1862, the instrument was somewhat out of order, and it is certain that this influenced the results for this month in an undue manner.

As in the case of the magnetic declination, the maximum of the disturbance in horizontal force occurred during the month of September, 1859, when 142 disturbances were recorded causing the horizontal force to be more, and 117 causing it to be less, than the respective final normal. The total number of disturbances East and West were, respectively, 1731 and 2991, of which number 2081 occurred during the months from April to September, and 2641 during the months from October to March. The number of disturbances decreasing the horizontal force preponderate.

TABLE SHOWING THE NUMBER OF DISTURBANCES INCREASING (+) AND DECREASING (—) THE HORIZONTAL FORCE.

1858-63.	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
April to Sept.	26	45	32	46	30	42	35	49	30	43	27	46	25	49	23	49	27	53	33	62	30	57	39	57
Oct. to March	32	64	36	63	31	74	29	60	30	58	41	54	40	70	45	66	45	73	46	69	52	75	60	78
Year.....	58	109	68	109	61	116	64	109	60	101	68	100	65	119	68	115	72	126	79	131	82	132	99	135

1858-63.	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
April to Sept.	39	48	36	63	37	62	30	66	24	69	30	73	30	73	28	67	32	66	25	69	23	62	27	47
Oct. to March	51	82	60	71	52	70	50	71	50	74	35	72	39	67	41	60	40	59	37	64	33	65	38	69
Year.....	90	130	96	134	89	132	80	137	74	143	65	145	69	140	69	127	72	123	62	133	56	127	65	116

From this table we obtain the following information respecting the time of the occurrence of the extremes in the number of disturbances:

For the period from April to September the minimum in increasing disturbance occurs at 7^h a.m. and 10^h p.m.

"	"	October to March	"	"	"	"	3 a.m.
"	"	April to September,	"	"	decreasing	"	2 ^h a.m.
"	"	October to March,	"	"	"	"	4 ^h a.m.
"	"	April to September, the maximum in increasing	"	"	"	"	noon.
"	"	October to March,	"	"	"	"	11 ^h a.m.
"	"	April to September,	"	"	decreasing	"	5 ^h and 6 ^h p.m.
"	"	October to March	"	"	"	"	noon.
	For the Year,	the minimum in increasing	"	"	"	"	10 ^h p.m.
	"	"	"	"	decreasing	"	5 ^h a.m.
	"	the maximum in increasing	"	"	"	"	11 ^h a.m.
	"	"	"	"	decreasing	"	5 ^h a.m.

If we divide the hours of the day into two portions, day hours (from 7^h a.m. to 6^h p.m.) and night hours (from 7^h p.m. to 6^h a.m.), and take, for each of the two groups, an average number of disturbances increasing and decreasing the horizontal force, we obtain the subjoined table:

1858—63.	DAY HOURS.		NIGHT HOURS.	
	+	—	+	—
April to September	31.50	61.00	28.33	52.58
October to March..	48.75	72.33	35.67	63.33
Year	80.25	133.33	64.00	115.91

We elicit from this table, that, paying no regard to the division of the year into winter and summer, the increasing and decreasing disturbances preponderate during the day hours and as such is also the case for the single subdivisions of the year, we feel disposed to accept this as the rule; on a closer examination, we find this also to be in accordance with the above enumerated hours of maxima and minima, however differently they may be situated in each group of disturbance (increasing or decreasing).

If we express the number of disturbances for each hour indiscriminately, increasing or decreasing, in percentages of the total number of observations available for the respective hour we obtain the subjoined table:

HOURLY NUMBER OF DISTURBANCES EXPRESSED IN PERCENTAGES OF THE
TOTAL NUMBER OF OBSERVATIONS.

1858—63.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
April to September	9.4	10.0	9.5	11.0	9.8	9.7	9.8	9.2	10.2	11.6	10.9	12.2
October to March..	11.2	11.5	12.2	10.4	10.3	11.1	12.6	12.7	12.6	13.0	14.3	15.4
Year	10.3	10.8	10.9	10.7	10.1	10.5	11.3	11.0	12.0	12.3	12.7	13.9

1858—63.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
April to September	10.9	12.7	12.4	12.2	11.6	12.6	12.4	12.2	12.2	12.2	10.8	9.5
October to March..	15.1	14.7	13.9	13.7	14.2	12.5	12.4	11.9	11.5	11.9	11.6	12.5
Year	13.1	13.7	13.2	12.9	13.0	12.5	12.4	12.1	11.9	12.0	11.2	11.1

The ratios of the disturbed hours to the total number of observations for the winter and summer seasons and for the year, expressed in percentages of the total number of observations in each period, are respectively 14.1, 9.0, and 10.3.

The aggregate amounts of disturbance throughout the whole period of observation, as shown in the two latter tables have been made instrumental in deriving mean amounts for the two main subdivisions of the year and the year. But for this purpose it is evident that the aggregate amounts had first to be reduced to parts of the horizontal force, as the value of a scale division did not remain the same for the whole period. This having been done, and due regard having been paid to the number of observations from which each aggregate amount had been originally derived, we obtained the following table:

MEAN AMOUNT OF DISTURBANCES, INCREASING (+) AND DECREASING (—) THE HORIZONTAL FORCE.

One part equal to 0.0001 of the Horizontal Force.

1858—63	MIDN.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
April to Sept.	17.18	24.66	17.40	26.73	21.46	25.03	15.12	24.44	16.17	24.92	15.71	24.43	16.28	22.33	14.63	23.51	14.94	22.69	13.50	24.74	17.02	23.14	14.21	24.64
Oct. to March	15.38	20.37	15.70	19.29	14.73	19.56	15.65	19.47	15.49	17.59	15.27	21.35	15.05	19.31	14.58	21.41	15.52	20.38	14.59	20.97	14.41	21.88	15.58	21.33
Year....	16.19	22.14	16.50	22.43	18.04	21.54	15.36	21.71	15.83	20.71	15.44	22.77	15.52	20.55	14.60	22.30	15.30	21.35	14.14	22.75	15.37	22.43	15.04	22.73

1858—63	NOON.		1h		2h		3h		4h		5h		6h		7h		8h		9h		10h		11h	
	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
April to Sept.	15.65	24.88	15.55	21.26	14.26	22.26	14.23	21.47	14.11	20.73	13.48	22.81	13.60	23.09	13.48	24.27	14.03	23.22	13.83	23.69	13.48	23.82	14.88	26.13
Oct. to March	15.42	19.58	15.18	19.08	15.47	18.96	14.94	18.49	16.31	17.86	16.29	18.08	16.34	18.82	16.56	18.66	15.30	19.65	14.76	19.70	16.21	19.35	15.26	18.40
Year....	15.52	21.54	15.32	20.11	14.97	20.51	14.67	19.92	15.59	19.25	14.99	20.46	15.09	21.05	15.31	21.62	14.73	21.53	14.38	21.77	15.09	21.53	15.10	21.53

From this we derive the following times at which the extremes in amount of disturbance occur:

For the period from April to September, the minimum in increasing disturbance occurs at 5h, 7h, and 10h p.m.

"	"	October to March,	"	"	"	"	"	10h a.m.
"	"	April to September,	"	"	decreasing	"	"	4h p.m.
"	"	October to March,	"	"	"	"	"	4h a.m.
"	"	April to September, the maximum in increasing	"	"	"	"	"	2h a.m.
"	"	October to March,	"	"	"	"	"	7h p.m.
"	"	April to September,	"	"	decreasing	"	"	1h a.m.
"	"	October to March,	"	"	"	"	"	10h a.m.

For the year,	the minimum in increasing	"	"	9h a.m.
"	decreasing	"	"	4h p.m.
"	the maximum in increasing	"	"	2h a.m.
"	decreasing	"	"	5h a.m.

Dividing the hours of the day in the usual manner, we obtain the mean hourly amounts of disturbance as follows:

One part equal to 0·0001 of the Horizontal Force.

1858—63.	DAY HOURS.		NIGHT HOURS.	
	+	—	+	—
April to September	14·60	22·93	15·75	24·47
October to March ..	15·38	19·74	15·45	19·39
Year.	15·05	21·20	15·62	21·65

According to these results, for the whole year the mean amount of disturbance in the horizontal force would be least in the day hours, both for increasing and decreasing cases, the difference, however, being very small. The same remark applies to the months from April to September, although the differences are in this case somewhat larger; while during the summer months the *increasing* mean amount of disturbance preponderates in the *night* hours, and the *decreasing* in the *day* hours, exhibiting also but very small differences.

How far these results will be borne out by future inquiry, remains to be decided by a more complete set of observations, less disturbed by causes already frequently alluded to in the course of this discussion.

23. In concluding this chapter on magnetic disturbances, I may be allowed to refer those especially interested to the complete catalogue of magnetic storms and displays of the Aurora Australis, published in "R. I.," pp. 251—260, and "R. II.," pp. 237—251. On all occasions of special interest, observations were made at shorter intervals, in most cases the interval between the readings being not longer than requisite for the reading of the instruments. In this way an immense number of disturbed observations have been accumulated, in addition to the regular hourly registrations; but, for obvious reasons, the idea of including in the plan of this volume such a vast amount of labour as the discussion thereof would have been, had to be abandoned. These observations will probably form the material of a future and special inquiry into the magnetic disturbances during the period over which the observations extend.

With regard to the records on disturbances in the magnetic inclination, published in "R. I.," pp. 251—260, it is to be remarked that, through some unaccountable mistake, the respective values are of the opposite algebraic sign to what they ought to be. It is, therefore, necessary to change the algebraic sign from *plus* to *minus*, and subtract the smallest value in each case from all the others, in order to obtain the correct disturbances in the magnetic inclination.

There is another class of disturbances which more frequently occur than at first sight one might feel inclined to suppose, and on which, had space and time allowed, I should have liked to have added a few observations. I refer to the effects electrical discharges exert upon the magnetic elements. The oscillations of the needle in the various instruments produced by flashes of lightning are of a peculiar character, and are deserving of more attention than has hitherto been bestowed upon them; in fact, as far as my present knowledge goes, they have not yet been noticed, or at least described, by other observers. The results of the observations on this point collected at the Flagstaff Observatory will, however, have to be withheld for the present, though I hope to have an opportunity of giving them in detail on a future occasion.

V. MAGNETIC INCLINATION.

HOURLY OBSERVATIONS.

24. The observations on the hourly motions of the magnetic inclination were made by the aid of a differential inclinometer, provided with soft iron bars in the manner proposed by Professor Lamont. From the beginning of the registrations, in May, 1858, to the commencement of June, 1861, two single bars with square sections were employed, while subsequently to the latter date two systems of bars, each composed of three flat pieces of soft iron, were made use of for effecting the deflection and measuring the changes in dip. It is scarcely necessary to mention that all conditions requisite for a satisfactory working of the instrument were complied with: as, for instance, reducing the torsion of the thread of suspension to a minimum, causing the effect of the two deflecting bars to be equal (*i.e.*, making the angle of deflection a minimum), ascertaining frequently the various coefficients of the instrument and determining the values of a part of division, etc. In the present case, particularly, it was thought of great importance to have the instrument frequently observed for some time previous to the systematic registration, in order to ensure that the induced magnetism of the bars had become constant, which effect was also assisted by immersing the bars alternately in hot and cold water.

As in the case of the magnetic declination and horizontal force, so with regard to the differential inclinometer, we have to distinguish several epochs at which changes in the instruments, scales, etc., took place. These changes are identical in time with those mentioned when speaking of the other instruments. At all times, and in every one of the places of observation, the instrument for observing the horary variation in the magnetic inclination was to the left of the declinometer, looking from the tubes towards the instruments. The distance of the mirror attached to the magnet from the centre of the stand for the tubes was at all times equal to the same distance in the other instruments; the same was the case also with respect to the distance of the mirror from the forepart of the scale; so that the angular value of a part of division (u) was in each of the three instruments the same. As already mentioned, this value u , in addition to its derivation from the actual measurement of the distances, was frequently observed by the aid of deflectors and comparisons made with the magnetic theodolite.

The distance of the centre of the inclinometer from the centre of the declinometer was, from the time of the commencement of the observations to the end of June, 1862, (Old Horary House), 51.52 in.; for the time the instruments were mounted in the Old Absolute House (July, August, and September, 1862), 55.10 in.; and in the New Horary House, 54.76 in.

From these distances, in conjunction with the results of deflection, both with large bars and small deflectors, the angle of deflection (ϕ') was determined to be as follows: from May, 1858,

to June, 1862, $\phi' = 44^{\circ}7'$; during July, August, and part of September (21st), 1862, $\phi' = 45^{\circ}50'$ and from September, 1862, to the discontinuance of the observations, $\phi' = 46^{\circ}15'$.

Up to the 20th of October, 1860, the divisions of the instrument, as seen by the naked eye, ran from right to left, and subsequent to that date in the reverse sense. If, therefore, D denote the reading of the declinometer, and I that of the instrument for observing changes in the magnetic inclination, the actual reading of the latter (n'') was prior to the above date $D - I$, and subsequent to it $I - D$. *For the whole period of observations in the tables subjoined; hereafter, an increase in the values corresponds to an increase in Southern inclination, and vice versa.*

The value of a scale division was, as already mentioned in the case of the declination and horizontal force, frequently observed, determinations of the factor of torsion and the coefficient of induction being included on each occasion. From these observations, the values of a scale division for the various periods were ascertained to be as follows:

- (1.) For the period from the 1st of May, 1858, to the 31st of October, 1860,

$$di = 0.383 (n'' - n) - 0.050 n + 0.068 n'.$$

- (2.) For the period from the 1st of November, 1860, to the 31st of May, 1861, and from the 1st of June, 1861, to the 30th of June, 1862,

$$di = 0.518 (n'' - n) - 0.055 n + 0.085 n'.$$

- (3.) For the period from the 1st of July to the 31st of August, 1862,

$$di = 0.471 (n'' - n) - 0.073 n + 0.095 n'.$$

- (4.) For the period from the 1st of September, 1862, to the end of February, 1863,

$$di = 0.482 (n'' - n) - 0.066 n + 0.096 n'.$$

The various values for n and n' have already been enumerated, and may be learnt on referring to the respective passages in this volume.

The graphical method employed in determining the sum of interfering influences, particularly the torsion, is analogous to that explained when speaking of the treatment of the original readings on the horizontal force, and we may therefore dispense with any account of it here. It may, however, be mentioned that, in order to avoid negative quantities, all the readings of the differential inclinometer have been reduced to a sufficiently large value to cause the monthly means to exceed 30 scale divisions.

25. The reasons which prompted me in refraining from printing the hourly observations on the magnetic inclination in full, have been explained in the preface; and it need only be added that for the same reasons I had to abstain from entering upon the extensive process of determining the final normals. The values embodied in the subjoined tables are simply the monthly means for each hour of the twenty-four during the whole period of observation. The results are again divided into two main groups, "Months from April to September," and "Months from October to March."

HOURLY MEANS OF THE MAGNETIC INCLINATION IN SCALE DIVISIONS. ALL OBSERVATIONS.

(MONTHS FROM APRIL TO SEPTEMBER.)

MONTHS.	Val. of a sc. div.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May ...	$\begin{cases} 0^{\circ}383 (n''-n) \\ -0^{\circ}050 n + 0^{\circ}068 n' \end{cases}$	33.32	33.43	33.15	32.95	32.85	32.80	32.61	32.66	32.50	33.43	34.90	36.46
" June ...	"	33.50	33.62	32.85	32.89	32.42	32.32	32.52	31.08	31.55	31.81	33.49	34.89
" July ...	"	34.38	34.28	33.84	33.73	33.24	33.09	33.04	32.42	31.32	31.47	32.66	33.38
" August ...	"	33.90	33.90	33.61	32.99	33.04	32.32	32.08	31.02	30.97	31.56	33.53	35.15
" September ...	"	33.29	34.02	33.25	33.26	32.61	32.76	32.36	32.62	33.20	35.07	36.61	38.20
1859 April ...	"	33.15	33.03	32.01	32.85	32.12	32.48	31.86	33.05	35.20	38.07	40.76	39.91
" May ...	"	32.54	31.97	31.83	31.40	31.66	31.30	30.99	30.53	30.91	33.28	35.63	37.11
" June ...	"	34.28	33.89	33.89	33.23	32.36	32.26	32.15	32.17	30.74	31.77	33.62	36.09
" July ...	"	33.40	32.73	33.42	32.59	31.93	31.50	31.32	30.41	29.59	30.19	33.64	37.57
" August ...	"	32.21	31.66	31.73	31.38	30.57	30.68	31.00	30.40	30.56	32.55	35.90	39.55
" September ...	"	31.02	29.67	30.22	30.10	29.75	29.26	29.40	31.10	32.03	37.33	41.78	43.59
1860 April ...	"	32.45	32.34	32.51	32.23	32.31	32.11	32.19	32.54	33.56	35.64	37.31	39.09
" May ...	"	33.80	33.77	33.49	33.16	32.20	32.43	32.05	32.01	31.99	32.68	34.22	36.30
" June ...	"	33.44	33.39	33.02	32.86	32.60	32.75	32.60	32.04	31.35	31.80	33.65	35.82
" July ...	"	34.08	33.69	33.63	32.97	32.88	32.85	32.15	31.35	31.25	32.05	34.02	36.97
" August ...	"	31.72	33.60	32.70	33.35	33.36	33.54	33.10	31.39	31.52	33.74	34.07	35.63
" September ...	"	33.02	32.20	32.94	32.50	32.47	32.05	31.71	32.13	32.66	33.86	35.63	37.46
1861 April ...	$\begin{cases} 0^{\circ}518 (n''-n) \\ -0^{\circ}055 n + 0^{\circ}085 n' \end{cases}$	32.13	32.18	32.35	32.15	31.67	31.75	31.68	31.99	33.69	36.41	38.42	39.13
" May ...	"	32.29	32.67	32.28	32.01	31.60	31.81	31.91	31.06	31.05	33.09	35.97	38.29
" June ...	"	34.33	33.89	33.62	33.45	33.37	33.32	33.45	32.65	32.44	32.84	33.36	34.90
" July ...	"	34.31	34.13	34.21	33.57	33.40	33.24	33.11	33.17	32.53	32.30	33.51	34.67
" August ...	"	34.96	34.97	34.58	34.26	33.77	33.85	33.25	32.71	31.74	31.95	32.57	33.23
" September ...	"	34.02	33.07	33.41	33.26	33.31	32.98	32.60	32.69	33.08	33.68	34.47	35.93
1862 April ...	"	33.50	32.90	33.31	33.42	33.15	32.98	33.01	33.23	33.84	35.17	36.51	36.10
" May ...	"	33.65	33.44	33.19	32.89	32.66	32.75	32.58	31.98	32.77	32.87	33.78	35.39
" June ...	"	33.81	33.61	33.54	33.24	33.44	33.14	33.44	32.40	32.58	33.00	33.88	34.31
" July ...	$\begin{cases} 0^{\circ}471 (n''-n) \\ -0^{\circ}073 n + 0^{\circ}095 n' \end{cases}$	32.89	33.17	33.15	32.71	32.34	32.05	31.29	32.16	32.25	32.50	33.62	36.26
" August ...	"	33.11	33.78	33.15	33.34	33.32	33.14	32.91	32.51	32.76	31.60	33.94	35.64
" September ...	$\begin{cases} 0^{\circ}482 (n''-n) \\ -0^{\circ}066 n + 0^{\circ}096 n' \end{cases}$	32.98	32.47	33.62	33.28	34.02	33.91	33.04	33.27	34.27	35.13	35.80	36.57

MONTHS.	val. of a sc. div.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May ...	$\begin{cases} 0^{\circ}383 (n''-n) \\ -0^{\circ}050 n + 0^{\circ}068 n' \end{cases}$	37.58	38.23	37.94	37.07	35.50	33.41	33.30	32.88	33.54	33.80	33.86	33.74
" June ...	"	36.50	36.91	37.66	37.72	36.31	34.56	34.01	34.44	35.17	35.25	34.48	33.93
" July ...	"	34.94	36.43	37.12	36.89	35.38	35.16	34.95	34.28	34.50	33.51	33.89	34.33
" August ...	"	36.62	37.09	38.25	36.95	34.45	33.94	33.83	33.76	34.71	34.51	34.43	34.26
" September ...	"	38.57	37.85	36.26	35.18	33.62	32.85	32.41	31.91	34.07	32.95	33.95	32.97
1859 April ...	"	38.52	35.54	34.31	34.21	34.24	33.23	32.46	32.60	33.12	33.59	33.42	32.59
" May ...	"	37.53	37.70	36.60	35.60	33.88	31.68	30.11	30.20	29.88	30.56	30.58	31.41
" June ...	"	37.93	39.26	39.34	37.18	35.42	34.74	35.16	34.05	33.90	33.64	32.69	33.02
" July ...	"	39.95	40.44	39.55	38.74	37.05	35.81	35.58	35.23	35.13	35.22	34.62	34.36
" August ...	"	41.42	41.66	40.79	38.92	37.40	35.94	34.82	34.11	34.11	33.68	32.63	32.66
" September ...	"	43.24	41.28	37.54	36.11	35.12	35.46	33.74	32.85	33.22	32.55	29.68	32.06
1860 April ...	"	38.47	38.08	37.12	36.07	35.54	34.21	32.87	32.90	32.46	32.48	33.05	32.92
" May ...	"	38.16	37.98	37.96	36.54	35.82	34.48	33.45	33.34	33.50	33.44	33.96	33.69
" June ...	"	37.52	37.41	37.49	37.20	35.02	33.53	34.42	34.53	34.40	34.22	34.28	34.31
" July ...	"	38.05	38.85	37.85	35.72	33.77	33.62	33.20	33.02	32.80	34.58	34.37	33.83
" August ...	"	37.02	37.89	37.39	36.80	35.24	34.86	32.50	32.92	33.69	33.10	34.25	34.58
" September ...	"	38.06	36.98	35.89	35.49	35.64	34.84	34.29	34.32	33.75	33.95	32.25	33.72
1861 April ...	$\begin{cases} 0^{\circ}518 (n''-n) \\ -0^{\circ}055 n + 0^{\circ}085 n' \end{cases}$	39.19	38.10	36.71	35.82	34.92	33.98	33.60	33.03	32.97	32.84	32.75	32.78
" May ...	"	38.75	38.63	38.42	37.55	36.06	34.64	33.82	33.59	33.57	33.30	33.29	32.89
" June ...	"	35.54	35.69	35.86	34.94	32.95	33.85	34.02	34.21	34.72	34.72	34.66	34.28
" July ...	"	35.45	35.79	35.73	34.84	34.34	33.94	33.95	33.92	34.57	34.28	34.45	34.40
" August ...	"	34.05	34.69	34.83	34.94	34.62	34.50	34.41	34.69	34.83	34.43	34.42	35.06
" September ...	"	36.16	35.82	34.83	34.42	34.18	34.37	34.27	34.09	34.53	34.23	34.63	34.42
1862 April ...	"	35.94	34.87	33.81	33.38	34.05	34.77	34.27	34.07	33.50	33.64	33.99	34.27
" May ...	"	36.23	36.49	36.64	36.00	34.39	34.08	34.06	33.91	33.83	34.74	34.29	33.34
" June ...	"	34.37	35.26	34.74	35.02	34.79	34.32	34.24	34.33	33.90	34.87	34.82	34.71
" July ...	$\begin{cases} 0^{\circ}471 (n''-n) \\ -0^{\circ}073 n + 0^{\circ}095 n' \end{cases}$	37.93	37.34	36.24	35.92	35.31	35.12	35.15	33.84	34.24	34.16	34.18	33.64
" August ...	"	36.35	36.65	36.21	36.28	34.96	34.86	34.74	34.44	34.46	34.55	34.15	33.22
" September ...	$\begin{cases} 0^{\circ}482 (n''-n) \\ -0^{\circ}066 n + 0^{\circ}096 n' \end{cases}$	36.32	35.48	34.17	32.92	33.11	32.71	32.88	33.24	32.67	33.12	33.68	33.54

HOURLY MEANS OF THE MAGNETIC INCLINATION IN SCALE DIVISIONS. ALL OBSERVATIONS.
(MONTHS FROM OCTOBER TO MARCH.)

MONTHS.	Val. of a sc. div.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ..	$\begin{cases} 0^{\circ}383 (n''-n) \\ -0^{\circ}050 n + 0^{\circ}068 n' \end{cases}$	32 88	33 17	32 96	32 02	32 51	32 01	31 79	33 41	35 37	37 78	40 74	41 03
„ November ..	„	33 20	33 15	33 61	33 03	32 85	32 85	33 39	34 65	37 62	38 82	41 27	40 09
„ December ..	„	34 36	34 75	34 67	34 86	34 32	35 02	35 70	36 37	37 41	37 00	37 82	38 19
1859 January ..	„	34 16	33 94	33 86	34 29	34 20	33 93	34 25	35 90	37 27	38 84	40 35	39 37
„ February ..	„	33 53	33 95	34 19	33 46	32 31	33 11	34 32	35 39	37 62	39 49	40 01	39 81
„ March ..	„	32 67	32 77	32 51	32 32	32 13	32 01	32 61	34 07	36 13	38 95	40 68	39 67
„ October ..	„	33 66	32 64	32 93	32 32	32 88	33 73	33 04	34 04	36 31	38 58	40 85	41 37
„ November ..	„	32 26	32 87	33 01	33 00	32 47	32 20	32 48	33 97	36 36	39 23	40 23	39 61
„ December ..	„	33 76	33 51	33 21	33 51	32 78	32 55	33 07	35 18	37 52	40 48	40 14	39 31
1860 January ..	„	33 02	33 18	33 05	32 99	33 05	33 01	32 79	33 54	35 91	38 55	40 09	40 10
„ February ..	„	33 19	32 89	32 48	32 86	32 85	32 62	32 48	34 00	36 22	39 35	40 81	40 42
„ March ..	„	34 48	34 34	33 37	33 06	32 10	32 55	32 51	33 88	36 44	38 82	40 77	40 91
„ October ..	„	33 47	33 58	33 41	32 98	32 45	31 94	32 19	32 54	34 02	36 25	38 71	39 64
„ November ..	$\begin{cases} 0^{\circ}518 (n''-n) \\ -0^{\circ}055 n + 0^{\circ}085 n' \end{cases}$	33 55	33 75	33 70	33 68	33 44	33 43	33 41	34 26	35 76	36 66	37 44	37 53
„ December ..	„	33 69	33 51	34 06	33 62	33 34	33 57	33 18	34 02	35 75	37 24	37 41	37 18
1861 January ..	„	32 67	32 76	32 94	32 80	32 90	32 10	32 61	34 39	35 35	36 75	37 94	38 58
„ February ..	„	32 72	32 01	32 04	32 15	32 28	32 19	32 34	32 75	34 29	36 24	37 82	38 91
„ March ..	„	32 66	32 20	32 27	31 98	32 17	31 89	32 34	33 06	34 51	36 39	38 53	39 46
„ October ..	„	33 80	33 45	33 57	33 11	32 98	32 89	32 91	33 44	34 54	35 77	37 13	37 22
„ November ..	„	34 18	34 01	33 44	33 69	33 60	33 65	33 98	34 83	36 04	37 50	38 04	37 26
„ December ..	„	33 44	33 05	33 35	33 61	33 69	33 89	34 25	35 60	37 11	38 27	38 13	37 10
1862 January ..	„	33 04	33 72	32 79	32 60	32 78	32 65	33 30	34 19	36 87	38 33	37 81	35 99
„ February ..	„	33 99	33 83	34 02	33 89	33 52	33 44	33 31	34 05	36 02	37 08	38 34	38 40
„ March ..	„	33 37	33 54	33 48	33 28	33 07	33 03	33 05	34 13	35 59	37 03	37 99	37 87
„ October ..	$\begin{cases} 0^{\circ}482 (n''-n) \\ -0^{\circ}066 n + 0^{\circ}096 n' \end{cases}$	33 00	33 77	33 70	33 00	33 03	32 61	32 59	34 74	45 83	37 00	37 46	36 70
„ November ..	„	31 53	31 22	31 94	33 00	32 10	32 26	32 66	32 30	34 01	36 16	36 51	35 98
„ December ..	„	33 94	33 68	33 16	33 63	33 61	33 76	34 49	35 56	35 85	38 46	38 64	38 08
1863 January ..	„	31 95	32 59	32 43	32 81	33 36	33 42	34 55	36 20	36 59	37 72	38 00	37 79
„ February ..	„	32 41	32 30	31 93	32 64	32 60	32 29	32 84	34 07	35 99	38 09	39 23	39 05

MONTHS	Val. of a sc. div.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ..	$\begin{cases} 0^{\circ}383 (n''-n) \\ -0^{\circ}050 n + 0^{\circ}068 n' \end{cases}$	39 07	37 55	34 02	32 32	32 65	32 59	32 51	32 79	31 84	32 55	32 32	32 71
„ November ..	„	36 91	34 30	32 00	30 68	30 67	30 86	31 35	30 88	32 15	32 81	33 42	33 06
„ December ..	„	35 72	32 77	31 02	30 23	30 91	30 39	31 56	33 04	33 31	33 39	34 00	33 99
1859 January ..	„	35 79	33 68	31 11	29 19	28 86	29 35	31 39	32 15	32 40	33 89	33 81	34 15
„ February ..	„	37 73	34 91	33 33	31 67	30 77	30 90	31 09	31 34	31 45	32 32	32 54	32 92
„ March ..	„	37 27	35 52	34 51	32 52	32 59	33 37	33 25	32 73	32 42	32 51	32 21	32 72
„ October ..	„	39 67	37 65	34 90	33 08	32 72	32 96	32 61	32 11	32 54	32 02	34 01	33 83
„ November ..	„	37 44	34 62	33 21	31 88	31 95	32 58	33 12	32 57	32 87	32 66	32 96	33 16
„ December ..	„	36 61	33 81	30 86	29 85	30 50	30 92	31 64	31 81	31 40	32 33	32 60	34 02
1860 January ..	„	38 27	36 03	33 82	32 84	31 68	31 76	32 30	32 79	32 13	31 96	32 13	33 22
„ February ..	„	38 43	36 77	34 35	32 20	31 77	32 26	32 10	31 92	32 09	32 60	32 25	32 46
„ March ..	„	39 63	37 57	34 94	33 43	33 61	34 40	33 43	32 25	34 30	33 66	33 80	33 42
„ October ..	„	37 91	35 98	34 15	33 15	32 57	32 93	33 02	33 19	33 53	33 57	33 79	33 36
„ November ..	$\begin{cases} 0^{\circ}518 (n''-n) \\ -0^{\circ}055 n + 0^{\circ}085 n' \end{cases}$	35 77	33 98	32 28	31 91	32 08	32 67	33 69	33 60	33 59	33 46	33 52	33 52
„ December ..	„	36 18	34 34	32 93	32 10	32 37	32 78	33 21	33 58	33 34	33 48	33 55	33 86
1861 January ..	„	37 85	36 65	35 01	33 81	32 43	32 15	32 52	32 47	32 94	32 70	31 98	32 66
„ February ..	„	38 86	37 62	36 43	35 06	33 76	33 38	32 97	33 12	32 60	32 95	33 10	32 86
„ March ..	„	38 86	37 81	35 90	34 42	33 82	33 68	33 51	33 17	32 62	32 75	32 08	32 86
„ October ..	„	36 88	35 34	34 06	32 65	32 88	33 55	33 48	33 30	33 82	33 55	33 32	34 15
„ November ..	„	35 00	33 09	31 91	31 41	31 77	32 65	33 29	33 54	33 68	33 95	33 65	33 71
„ December ..	„	35 41	33 62	31 70	30 96	31 14	32 26	32 65	33 67	33 50	33 13	32 96	33 51
1862 January ..	„	36 12	35 26	33 41	31 96	32 22	32 22	31 92	31 71	32 78	32 22	32 18	32 81
„ February ..	„	37 20	36 45	33 97	32 99	32 04	32 64	32 70	33 41	33 33	33 23	33 54	33 63
„ March ..	„	36 17	33 96	32 82	32 35	32 18	32 78	33 36	33 36	33 71	33 99	33 61	33 59
„ October ..	$\begin{cases} 0^{\circ}482 (n''-n) \\ -0^{\circ}066 n + 0^{\circ}096 n' \end{cases}$	34 81	33 24	32 42	32 63	33 76	33 91	34 51	33 58	34 10	34 30	33 96	33 56
„ November ..	„	33 60	31 30	30 01	29 90	29 75	31 40	31 67	31 86	31 52	31 48	30 88	31 67
„ December ..	„	36 41	33 63	31 09	30 29	30 64	31 87	32 58	33 30	33 46	33 54	34 24	34 37
1863 January ..	„	36 77	34 61	32 83	32 54	31 95	31 90	32 61	33 06	32 82	32 05	32 26	32 82
„ February ..	„	37 34	35 40	33 87	33 28	32 49	32 43	33 22	32 89	33 17	33 05	32 93	32 64

The following little table shows the monthly means in scale divisions, derived from the hourly observations:

MONTHLY MEANS OF THE MAGNETIC INCLINATION IN SCALE DIVISIONS.

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1858	—	—	—	—	34.25	34.16	34.09	34.04	34.16	34.11	33.90	34.20
1859	34.01	34.14	34.09	34.26	32.70	34.28	31.58	34.43	34.09	34.60	34.03	33.81
1860	34.09	34.14	34.09	34.18	34.18	34.15	34.06	34.08	34.08	34.10	34.03	34.10
1861	33.96	34.10	34.12	34.18	34.11	34.09	34.08	34.05	34.10	34.07	34.08	34.00
1862	33.70	34.38	34.05	34.07	34.00	33.99	34.06	34.17	33.84	34.09	32.28	34.09
1863	33.90	34.01	—	—	—	—	—	—	—	—	—	—

By the aid of the above values of a scale division, these values were reduced to minutes:

MONTHLY MEANS OF THE MAGNETIC INCLINATION IN MINUTES.

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1858	—	—	—	—	13.13	13.09	13.06	13.05	13.09	13.07	12.99	13.11
1859	13.03	13.08	13.06	13.13	12.54	13.14	13.25	13.19	13.06	13.26	13.04	12.96
1860	13.06	13.08	13.37	13.10	13.10	13.09	13.05	13.06	13.06	14.70	17.62	17.65
1861	17.58	17.65	17.66	17.69	17.66	17.65	17.64	17.63	17.65	17.64	17.64	17.60
1862	17.44	17.80	17.63	17.64	17.60	17.59	16.05	16.10	16.28	16.41	15.53	16.41
1863	16.32	16.38	—	—	—	—	—	—	—	—	—	—

This table we shall have again to refer to, when treating of the absolute magnetic inclination, with a view to ascertain the zero points of the scale.

26. Hourly Variation of the Magnetic Inclination. The above mean hourly values have been reduced to minutes; and inasmuch as the readings of the differential inclinometer were also affected by the declination and the horizontal force, the hourly changes of each of these elements had to be taken into consideration in determining the values of the subsequent tables. The minimum value in each month, moreover, was subtracted in the usual manner from the various values of that month, causing thereby that minimum to be equal to zero.

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC INCLINATION IN MINUTES. ALL OBSERVATIONS.
(MONTHS FROM APRIL TO SEPTEMBER.)

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May	0.17	0.27	0.12	0.09	0.11	0.06	0.00	0.07	0.02	0.28	0.79	1.25
" June	0.65	0.73	0.50	0.57	0.45	0.44	0.54	0.00	0.36	0.42	0.94	1.34
" July	0.74	0.70	0.59	0.58	0.57	0.46	0.49	0.32	0.00	0.05	0.36	0.54
" August	0.73	0.73	0.72	0.53	0.57	0.33	0.33	0.00	0.02	0.12	0.65	1.04
" September	0.65	0.97	0.71	0.72	0.56	0.61	0.52	0.62	0.67	1.03	1.26	1.67
1859 April	0.39	0.43	0.00	0.36	0.05	0.20	0.08	0.41	1.08	1.91	2.85	2.54
" May	0.97	0.80	0.76	0.64	0.72	0.62	0.51	0.39	0.55	1.40	2.19	2.75
" June	1.26	1.13	1.06	0.13	0.64	0.53	0.51	0.62	0.00	0.39	0.96	1.85
" July	1.33	1.06	1.39	0.95	0.78	0.63	0.66	0.27	0.00	0.31	1.63	3.14
" August	0.53	0.21	0.32	0.22	0.00	0.10	0.35	0.19	0.15	0.87	2.21	3.66
" September	0.82	0.00	0.26	0.41	0.23	0.33	0.42	0.66	1.21	3.32	4.98	5.35
1860 April	0.13	0.10	0.10	0.11	0.09	0.05	0.10	0.18	0.38	0.85	1.29	1.85
" May	0.47	0.56	0.39	0.31	0.11	0.13	0.02	0.00	0.02	0.12	0.54	1.15
" June	0.52	0.51	0.42	0.42	0.34	0.40	0.38	0.23	0.00	0.18	0.65	1.23
" July	0.84	0.72	0.78	0.58	0.61	0.53	0.28	0.04	0.00	0.27	0.87	1.67
" August	0.75	0.60	0.36	0.56	0.59	0.66	0.51	0.00	0.03	0.74	0.62	1.06
" September	0.33	0.05	0.34	0.23	0.22	0.12	0.00	0.09	0.13	0.34	0.77	1.26
1861 April	0.25	0.28	0.34	0.23	0.07	0.09	0.07	0.00	0.79	2.01	2.99	3.34
" May	0.53	0.75	0.58	0.45	0.22	0.39	0.56	0.00	0.12	1.05	2.51	3.65
" June	0.78	0.59	0.41	0.37	0.44	0.58	0.59	0.30	0.00	0.21	0.27	0.80
" July	0.72	0.62	0.72	0.44	0.39	0.34	0.34	0.42	0.27	0.00	0.30	0.59
" August	1.11	1.13	0.93	0.91	0.68	0.77	0.54	0.43	0.00	0.00	0.02	0.03
" September	0.45	0.17	0.24	0.26	0.41	0.20	0.13	0.21	0.40	0.11	0.09	0.46
1862 April	0.29	0.07	0.23	0.23	0.13	0.26	0.24	0.24	0.51	0.85	1.09	0.82
" May	0.58	0.49	0.40	0.33	0.25	0.46	0.32	0.00	0.46	0.30	0.39	1.15
" June	0.44	0.33	0.32	0.19	0.43	0.45	0.49	0.05	0.09	0.25	0.24	0.31
" July	0.45	0.50	0.62	0.46	0.41	0.40	0.00	0.39	0.38	0.39	0.47	1.52
" August	0.01	0.35	0.18	0.46	0.56	0.49	0.56	0.40	0.41	0.36	0.31	0.74
" September	0.45	0.26	0.81	0.83	1.29	1.34	0.97	0.95	1.02	1.08	1.05	1.42

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 May	1.65	1.93	1.80	1.57	1.01	0.20	0.17	0.04	0.23	0.32	0.34	0.34
" June	1.92	2.10	2.31	2.37	1.96	1.25	1.00	1.05	1.22	1.20	0.88	0.77
" July	1.03	1.59	1.87	1.86	1.39	1.22	1.08	0.73	0.75	0.43	0.49	0.64
" August	1.49	1.64	2.12	1.73	0.96	0.76	0.62	0.61	0.96	0.83	0.81	0.77
" September	1.83	1.69	1.36	1.10	0.58	0.32	0.11	0.00	0.82	0.43	0.83	0.51
1859 April	2.11	1.26	0.96	0.96	0.91	0.49	0.18	0.26	0.51	0.51	0.57	0.20
" May	2.81	2.91	2.46	2.22	1.69	0.79	0.16	0.16	0.00	0.27	0.33	0.52
" June	2.54	2.01	3.10	2.46	1.98	1.58	1.82	1.29	1.18	1.03	0.55	0.68
" July	4.15	4.34	3.96	3.84	3.24	2.75	2.57	2.27	2.16	2.15	1.81	1.71
" August	4.30	4.56	4.35	3.78	3.28	2.60	2.16	1.73	1.41	1.37	0.81	0.74
" September	5.57	5.03	3.99	3.58	3.22	3.04	2.14	1.84	1.76	1.65	0.74	1.00
1860 April	1.80	1.85	1.61	1.23	1.13	0.71	0.31	0.30	0.11	0.00	0.18	0.15
" May	1.73	1.61	1.74	1.40	1.21	0.69	0.37	0.33	0.42	0.45	0.51	0.48
" June	1.75	1.70	1.80	1.86	1.17	0.64	0.96	0.99	0.92	0.86	0.83	0.84
" July	1.86	2.25	2.05	1.54	0.93	0.81	0.61	0.55	0.43	1.03	0.90	0.73
" August	1.48	1.72	1.62	1.66	1.22	1.08	0.16	0.41	0.61	0.32	0.80	0.90
" September	1.58	1.27	1.14	1.16	1.27	1.00	0.84	0.82	0.59	0.68	0.06	0.57
1861 April	3.42	3.07	2.61	2.37	1.93	1.36	1.25	0.88	0.85	0.63	0.59	0.66
" May	3.89	3.92	3.92	3.52	2.87	2.08	1.63	1.36	1.18	1.10	0.97	0.71
" June	0.76	0.93	1.10	0.84	0.04	0.55	0.66	0.65	0.78	0.84	0.86	0.87
" July	0.65	0.74	0.73	0.59	0.54	0.39	0.40	0.44	0.75	0.58	0.71	0.74
" August	0.12	0.37	0.34	0.50	0.45	0.73	0.59	0.80	0.97	0.75	0.80	1.04
" September	0.40	0.29	0.00	0.09	0.06	0.26	0.28	0.19	0.54	0.51	0.70	0.63
1862 April	0.70	0.58	0.14	0.00	0.23	0.53	0.52	0.39	0.15	0.28	0.39	0.49
" May	1.32	1.63	1.88	1.59	0.80	0.50	0.73	0.53	0.43	1.11	0.87	0.36
" June	0.00	0.65	0.51	0.75	0.78	0.42	0.77	0.54	0.28	0.93	0.84	0.87
" July	2.01	1.95	1.75	1.70	1.58	1.34	1.53	0.78	0.87	0.92	1.02	0.84
" August	0.81	1.16	1.14	1.29	0.77	0.83	0.74	0.46	0.55	0.57	0.52	0.00
" September	1.09	1.11	0.79	0.11	0.33	0.10	0.24	0.08	0.00	0.34	0.51	0.54

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC INCLINATION IN MINUTES. ALL OBSERVATIONS.
(MONTHS FROM OCTOBER TO MARCH.)

MONTHS.	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ...	0.37	0.46	0.38	0.18	0.37	0.22	0.06	0.50	0.94	1.40	2.45	2.64
„ November ...	0.78	0.84	1.06	0.83	0.76	0.76	0.88	1.17	1.93	2.15	2.98	2.72
„ December ...	1.51	1.71	1.66	1.73	1.57	1.84	1.98	2.07	2.14	1.64	1.68	1.96
1859 January ...	1.66	1.52	1.59	1.84	1.78	1.63	1.72	2.16	2.38	2.56	3.07	2.77
„ February ...	0.98	1.20	1.21	0.94	0.51	0.90	1.33	1.44	2.05	2.32	2.19	2.17
„ March ...	0.25	0.32	0.19	0.06	0.09	0.06	0.27	0.72	1.30	1.96	2.37	2.01
„ October ...	0.69	0.27	0.25	0.12	0.46	0.62	0.42	0.49	1.22	1.62	2.33	2.64
„ November ...	0.04	0.18	0.36	0.31	0.09	0.00	0.00	0.41	0.95	1.80	2.08	1.97
„ December ...	0.83	0.79	0.68	0.84	0.43	0.35	0.43	0.96	1.47	2.40	2.28	2.17
1860 January ...	0.29	0.24	0.26	0.19	0.23	0.17	0.05	0.12	0.73	1.37	2.12	2.10
„ February ...	0.38	0.24	0.14	0.23	0.29	0.19	0.00	0.41	0.95	1.95	2.47	2.30
„ March ...	0.74	0.68	0.35	0.31	0.00	0.11	0.05	0.28	1.01	1.62	2.18	2.37
„ October ...	0.45	0.55	0.44	0.40	0.19	0.00	0.07	0.02	0.42	0.95	1.80	2.19
„ November ...	0.38	0.45	0.44	0.47	0.43	0.41	0.34	0.55	1.01	1.23	1.41	1.60
„ December ...	0.38	0.20	0.54	0.32	0.29	0.31	0.03	0.25	0.91	1.51	1.51	1.33
1861 January ...	0.42	0.36	0.46	0.30	0.34	0.00	0.20	0.79	0.96	1.42	2.02	2.52
„ February ...	0.33	0.00	0.04	0.15	0.28	0.13	0.14	0.12	0.76	1.48	2.00	2.63
„ March ...	0.36	0.00	0.25	0.05	0.11	0.07	0.28	0.34	0.67	1.14	2.18	2.63
„ October ...	0.93	0.90	1.00	0.74	0.70	0.74	0.75	0.87	1.17	1.34	1.64	1.39
„ November ...	1.31	1.42	1.13	1.29	1.28	1.22	1.32	1.51	1.80	1.83	1.82	1.55
„ December ...	1.31	1.14	0.34	1.31	1.32	1.49	1.63	1.84	2.31	2.29	2.07	1.75
1862 January ...	1.28	1.38	0.89	0.63	0.78	0.83	1.06	1.23	1.92	2.22	1.74	0.84
„ February ...	0.85	0.84	0.89	0.86	0.74	0.64	0.57	0.81	1.42	1.51	1.71	1.66
„ March ...	0.56	0.64	0.70	0.45	0.45	0.31	0.35	0.72	1.15	1.58	1.70	1.61
„ October ...	0.86	1.22	1.15	0.99	1.00	0.76	0.71	1.45	1.04	1.60	1.52	1.04
„ November ...	0.96	0.86	1.60	2.15	1.67	1.48	1.79	1.14	1.70	2.18	1.95	2.02
„ December ...	1.80	1.95	1.76	1.77	1.86	2.13	2.41	2.41	2.29	2.89	2.69	2.44
1863 January ...	0.70	0.74	1.05	0.97	1.14	1.01	1.52	2.06	1.91	2.20	2.40	1.94
„ February ...	0.13	0.18	0.00	0.48	0.39	0.21	0.49	0.79	1.27	1.61	1.73	1.82

MONTHS.	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
1858 October ...	2.27	2.01	0.99	0.44	0.42	0.29	0.18	0.30	0.00	0.23	0.11	0.22
„ November ...	2.02	1.49	0.91	0.51	0.31	0.20	0.27	0.00	0.52	0.76	1.03	0.83
„ December ...	1.45	0.62	0.36	0.06	0.26	0.00	0.39	0.93	1.06	1.21	1.42	1.36
1859 January ...	1.63	1.19	0.57	0.10	0.00	0.11	0.82	0.94	1.10	1.70	1.58	1.71
„ February ...	1.70	1.03	0.75	0.44	0.04	0.01	0.00	0.21	0.26	0.63	0.63	0.64
„ March ...	1.33	0.99	0.77	0.20	0.22	0.39	0.34	0.23	0.18	0.18	0.00	0.25
„ October ...	2.27	1.93	1.14	0.72	0.58	0.43	0.23	0.00	0.21	0.04	0.79	0.74
„ November ...	1.54	0.93	0.71	0.35	0.26	0.33	0.38	0.20	0.33	0.22	0.31	0.37
„ December ...	1.57	0.91	0.20	0.00	0.08	0.03	0.24	0.16	0.06	0.48	0.52	0.90
1860 January ...	1.83	1.39	0.78	0.63	0.15	0.09	0.15	0.27	0.06	0.00	0.06	0.37
„ February ...	1.91	1.69	0.98	0.40	0.29	0.38	0.20	0.05	0.14	0.35	0.17	0.23
„ March ...	2.15	1.74	1.03	0.57	0.53	0.77	0.39	0.14	0.81	0.61	0.58	0.44
„ October ...	1.73	1.28	0.86	0.64	0.29	0.35	0.31	0.35	0.52	0.50	0.58	0.48
„ November ...	1.07	0.51	0.00	0.05	0.03	0.18	0.47	0.36	0.37	0.35	0.38	0.33
„ December ...	1.20	0.68	0.34	0.00	0.23	0.10	0.16	0.49	0.28	0.28	0.29	0.45
1861 January ...	2.30	2.16	1.56	1.24	0.55	0.47	0.58	0.28	0.51	0.40	0.06	0.32
„ February ...	2.85	2.54	2.22	1.70	1.15	1.07	0.72	0.80	0.45	0.52	0.50	0.39
„ March ...	2.63	2.48	2.01	1.49	1.09	0.89	0.63	0.57	0.33	0.29	0.06	0.43
„ October ...	1.40	0.77	0.49	0.00	0.26	0.58	0.58	0.53	0.82	0.73	0.70	1.10
„ November ...	0.88	0.33	0.00	0.09	0.22	0.57	0.68	1.01	1.04	1.00	1.10	1.07
„ December ...	1.31	0.76	0.16	0.00	0.16	0.70	0.93	1.25	1.26	1.17	1.11	1.25
1862 January ...	1.28	1.25	0.78	0.00	0.28	0.45	0.24	0.11	1.00	0.73	0.58	0.95
„ February ...	1.31	1.13	0.41	0.31	0.00	0.23	0.28	0.55	0.55	0.55	0.60	0.66
„ March ...	1.05	0.16	0.00	0.08	0.06	0.33	0.41	0.47	0.54	0.77	0.61	0.57
„ October ...	0.51	0.16	0.00	0.12	0.77	1.04	1.31	0.92	1.07	1.28	1.02	0.99
„ November ...	1.13	0.34	0.00	0.09	0.12	0.98	0.79	0.72	0.80	0.75	0.58	1.14
„ December ...	2.10	1.05	0.22	0.00	0.11	0.66	0.95	0.72	1.20	1.51	2.01	1.85
1863 January ...	2.71	1.11	0.51	0.58	0.10	0.00	0.18	0.34	0.36	0.30	0.41	0.62
„ February ...	1.36	0.76	0.34	0.31	0.11	0.07	0.39	0.29	0.41	0.37	0.31	0.17

From these tables the mean hourly variation table for every month, half-year, and for the year, subjoined hereafter, was derived, by simply taking the means for every hour and month, half-year, or year, as the case might be. In each period the values were again diminished by the respective minimum. Subsequently, general means for each month, half-year, and the year were taken; they are also to be employed in the equations expressing the horary variation of the magnetic inclination, of which we shall have to speak presently.

MEAN SOLAR DIURNAL VARIATION IN THE MAGNETIC INCLINATION IN MINUTES.

(Derived from all Observations.)

HOUR	DURING THE YEARS 1858—1863.														
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum.	Wint.	Year.
Midnight.	0.65	0.21	0.33	0.19	0.45	0.64	0.69	0.51	0.25	0.28	0.50	1.16	0.44	0.31	0.15
1h	0.63	0.17	0.38	0.27	0.63	0.57	0.59	0.48	0.00	0.30	0.56	1.15	0.45	0.28	0.14
2d	0.63	0.14	0.27	0.15	0.36	0.45	0.69	0.38	0.18	0.26	0.73	0.99	0.42	0.23	0.10
3h	0.57	0.22	0.08	0.18	0.27	0.25	0.47	0.42	0.20	0.11	0.82	1.18	0.42	0.16	0.06
4h	0.63	0.12	0.00	0.00	0.19	0.37	0.42	0.36	0.25	0.16	0.66	1.08	0.36	0.12	0.01
5h	0.51	0.09	0.01	0.10	0.24	0.39	0.34	0.35	0.23	0.09	0.58	1.21	0.33	0.13	0.00
6h	0.69	0.19	0.16	0.12	0.19	0.41	0.22	0.34	0.12	0.02	0.68	1.29	0.42	0.09	0.03
7h	1.05	0.39	0.44	0.22	0.00	0.15	0.16	0.08	0.22	0.29	0.77	1.50	0.66	0.00	0.10
8h	1.36	0.97	0.94	0.68	0.14	0.00	0.00	0.00	0.40	0.58	1.29	1.81	1.08	0.06	0.34
9h	1.73	1.45	1.44	1.35	0.54	0.20	0.07	0.30	0.89	1.00	1.65	2.14	1.49	0.42	0.82
10h	2.05	1.70	1.92	1.94	1.19	0.52	0.60	0.64	1.34	1.57	1.86	2.04	1.78	0.90	1.11
11h	1.81	1.80	1.92	1.99	1.90	1.02	1.36	1.19	1.74	1.60	1.78	1.92	1.72	1.39	1.33
Noon.	1.73	1.51	1.55	1.94	2.19	1.30	1.81	1.52	1.80	1.26	1.14	1.52	1.37	1.62	1.27
1h	1.20	1.11	1.08	1.62	2.31	1.39	2.04	1.77	1.59	0.85	0.53	0.79	0.85	1.65	1.02
2h	0.62	0.62	0.71	1.26	2.27	1.67	1.94	1.79	1.17	0.32	0.13	0.25	0.36	1.54	0.72
3h	0.29	0.31	0.35	1.07	1.97	1.57	1.78	1.67	0.92	0.00	0.03	0.00	0.08	1.36	0.49
4h	0.00	0.00	0.23	0.98	1.43	1.10	1.41	1.22	0.80	0.08	0.00	0.16	0.00	1.02	0.28
5h	0.00	0.03	0.32	0.70	0.76	0.80	1.17	1.08	0.65	0.16	0.26	0.29	0.10	0.72	0.18
6h	0.17	0.00	0.20	0.49	0.52	0.95	1.11	0.73	0.43	0.14	0.33	0.52	0.15	0.56	0.13
7h	0.17	0.06	0.13	0.39	0.39	0.81	0.82	0.68	0.30	0.04	0.27	0.70	0.15	0.42	0.06
8h	0.39	0.04	0.27	0.33	0.36	0.79	0.86	0.78	0.45	0.14	0.42	0.76	0.26	0.45	0.13
9h	0.41	0.16	0.29	0.28	0.56	0.88	0.89	0.65	0.43	0.18	0.43	0.92	0.32	0.47	0.17
10h	0.32	0.12	0.15	0.36	0.51	0.70	0.86	0.63	0.28	0.26	0.49	1.06	0.32	0.42	0.14
11h	0.57	0.10	0.28	0.30	0.39	0.72	0.80	0.57	0.36	0.33	0.56	1.15	0.42	0.38	0.17
Means ...	0.757	0.490	0.560	0.705	0.823	0.735	0.879	0.756	0.625	0.417	0.686	1.066	0.581	0.612	0.373

The above values have been treated according to Bessel's interpolation formula, whereby we obtained the following equations, in which the first terms are the general means for each month, half-year, and the year:

<i>January</i>	$I^{(n)} = 0.757 + 0.633 \sin(n 15^\circ + 135^\circ 33') + 0.480 \sin(n 30^\circ + 131^\circ 55')$ $+ 0.176 \sin(n 45^\circ + 150^\circ 57') + \dots$
<i>February</i>	$= 0.480 + 0.643 \sin(n 15^\circ + 113^\circ 26') + 0.463 \sin(n 30^\circ + 125^\circ 39')$ $+ 0.195 \sin(n 45^\circ + 149^\circ 30') + \dots$
<i>March</i>	$= 0.560 + 0.604 \sin(n 15^\circ + 104^\circ 57') + 0.494 \sin(n 30^\circ + 127^\circ 17')$ $+ 0.226 \sin(n 45^\circ + 168^\circ 41') + \dots$
<i>April</i>	$= 0.705 + 0.771 \sin(n 15^\circ + 82^\circ 29') + 0.412 \sin(n 30^\circ + 105^\circ 2')$ $+ 0.163 \sin(n 45^\circ + 153^\circ 20') + \dots$
<i>May</i>	$= 0.823 + 0.818 \sin(n 15^\circ + 63^\circ 42') + 0.607 \sin(n 30^\circ + 60^\circ 52')$ $+ 0.196 \sin(n 45^\circ + 47^\circ 15') + \dots$
<i>June</i>	$= 0.735 + 0.496 \sin(n 15^\circ + 30^\circ 17') + 0.283 \sin(n 30^\circ + 46^\circ 32')$ $+ 0.188 \sin(n 45^\circ + 33^\circ 15') + \dots$
<i>July</i>	$= 0.879 + 0.647 \sin(n 15^\circ + 34^\circ 15') + 0.442 \sin(n 30^\circ + 46^\circ 40')$ $+ 0.215 \sin(n 45^\circ + 48^\circ 49') + \dots$
<i>August</i>	$= 0.756 + 0.583 \sin(n 15^\circ + 43^\circ 15') + 0.369 \sin(n 30^\circ + 43^\circ 56')$ $+ 0.190 \sin(n 45^\circ + 42^\circ 49') + \dots$
<i>September</i>	$= 0.625 + 0.627 \sin(n 15^\circ + 78^\circ 4') + 0.366 \sin(n 30^\circ + 94^\circ 47')$ $+ 0.176 \sin(n 45^\circ + 100^\circ 56') + \dots$
<i>October</i>	$= 0.417 + 0.424 \sin(n 15^\circ + 112^\circ 49') + 0.435 \sin(n 30^\circ + 125^\circ 4')$ $+ 0.223 \sin(n 45^\circ + 153^\circ 50') + \dots$
<i>November</i>	$= 0.686 + 0.496 \sin(n 15^\circ + 150^\circ 44') + 0.399 \sin(n 30^\circ + 150^\circ 4')$ $+ 0.287 \sin(n 45^\circ + 165^\circ 54') + \dots$
<i>December</i>	$= 1.066 + 0.589 \sin(n 15^\circ + 171^\circ 39') + 0.475 \sin(n 30^\circ + 167^\circ 8')$ $+ 0.191 \sin(n 45^\circ + 165^\circ 26') + \dots$
<i>Summer</i>	$= 0.581 + 0.517 \sin(n 15^\circ + 131^\circ 6') + 0.451 \sin(n 30^\circ + 136^\circ 20')$ $+ 0.216 \sin(n 45^\circ + 152^\circ 57') + \dots$
<i>Winter</i>	$= 0.612 + 0.618 \sin(n 15^\circ + 57^\circ 46') + 0.375 \sin(n 30^\circ + 65^\circ 37')$ $+ 0.145 \sin(n 45^\circ + 63^\circ 9') + \dots$
<i>Year</i>	$= 0.373 + 0.461 \sin(n 15^\circ + 91^\circ 12') + 0.340 \sin(n 30^\circ + 106^\circ 2')$ $+ 0.123 \sin(n 45^\circ + 127^\circ 50') + \dots$

The values of the above table have been thrown into curves on Plate 25; and from them we gather the following information respecting the times of maximum and minimum in the Southern magnetic inclination. The curves for the typical year, for the period from 1858 to 1863, show a primary maximum at or a little after 11^h a.m., and a minimum at 5^h a.m., secondary extremes occurring, respectively between 9^h and 11^h p.m. and at 7^h p.m. Throughout the whole year, we observe that the time of primary maximum varies between the hours 9^h 30^m a.m. and

2^h p.m., occurring earlier in the summer, and later during the winter months. With regard to the minimum, our curves show the general characteristic, that during the summer months that in the afternoon is the primary minimum, while during the winter months it seems to be that in the forenoon, the curves for the equinoctial months being somewhat indistinct in this respect. These relations are clearly exhibited in the semi-annual curves; but it ought also to be noted that on the whole the characteristic of a double fluctuation in the solar diurnal variation in the magnetic inclination is but merely indicated, and not clearly expressed, the secondary maximum almost disappearing when compared with the primary. The semi-annual curves, moreover, show that the amplitude in solar diurnal variation is greater during the time of the year when the sun's declination is South, than when the sun's declination is North, and seems to be greatest in the month of December.

27. Amplitude in the Solar Diurnal Variation of the Magnetic Inclination. The table in this paragraph shows the amplitude in the solar diurnal variation for the various months and years of observations, derived from all observations (*i.e.*, disturbances not eliminated). At the bottom of the column for each month, half year, and the year, a general mean is inserted, which may be taken as representing the various months and periods of the typical year for the period of observation.

AMPLITUDE OF THE SOLAR DIURNAL VARIATION IN MAGNETIC INCLINATION.

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Sum.	Wint.	Year.
18 $\frac{5}{8}$	3.07	2.32	—	—	1.93	2.37	1.87	2.12	1.83	2.64	2.98	2.14	2.63	2.02	2.33
18 $\frac{6}{8}$	2.12	2.47	2.37	2.85	2.91	3.10	4.34	4.56	5.57	2.64	2.08	2.40	2.35	3.89	3.12
18 $\frac{7}{8}$	2.52	2.85	2.37	1.85	1.74	1.86	2.25	1.72	1.58	2.19	1.60	1.51	2.17	1.83	2.01
18 $\frac{8}{8}$	2.22	1.71	2.63	3.42	3.92	1.10	0.75	1.13	0.70	1.64	1.83	2.31	2.06	1.84	1.95
18 $\frac{9}{8}$	2.71	1.82	1.70	1.09	1.88	0.93	2.01	1.29	1.42	1.60	2.18	2.89	2.15	1.44	1.79
1858—63	2.53	2.23	2.27	2.30	2.48	1.87	2.24	2.16	2.22	2.14	2.13	2.25	2.27	2.20	2.24

On examining this table somewhat more closely, we perceive that the maximum in the amplitude occurs during the month of January, and the minimum in June, and that the summer half-yearly amplitude is larger than that in the winter — facts which we have already recognized when considering the solar diurnal variation tables for the magnetic inclination.

A glance at the last column of this table shows, moreover, that the mean amplitude *for the year 1859—60 is a maximum, and that the mean values gradually decrease as we recede from that year.* This fact is of particular interest with regard to the eleven years' period in magnetic variations, but cannot be here strictly investigated on account of the shortness of the period over which the observations extend.

23. Semi-annual Inequality of the Solar Diurnal Variation in the Magnetic Inclination. The following little table shows the solar diurnal variation curves for summer, winter, and the year, referred to their respective means, 0.581, 0.612, and 0.373.

SEMI-ANNUAL INEQUALITY IN THE SOLAR DIURNAL VARIATION OF THE
MAGNETIC INCLINATION.

	NOON.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Summer	+0.79	+0.27	-0.22	-0.50	-0.58	-0.48	-0.43	-0.43	-0.32	-0.26	-0.26	-0.16
Winter	+1.01	+1.04	+0.93	+0.75	+0.41	+0.11	-0.05	-0.19	-0.16	-0.14	-0.19	-0.23
Year	+0.90	+0.65	+0.35	+0.12	-0.09	-0.19	-0.24	-0.31	-0.24	-0.20	-0.23	-0.20
Summer <i>minus</i> year	-0.11	-0.38	-0.57	-0.62	-0.49	-0.29	-0.19	-0.12	-0.08	-0.06	-0.03	+0.04
Winter <i>minus</i> year	+0.11	+0.39	+0.58	+0.63	+0.50	+0.30	+0.19	+0.12	+0.08	+0.06	+0.04	-0.03

	MIDN.	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
Summer	-0.04	-0.13	-0.16	-0.16	-0.22	-0.25	-0.16	+0.08	+0.50	+0.91	+1.20	+1.14
Winter	-0.30	-0.33	-0.38	-0.45	-0.49	-0.48	-0.52	-0.61	-0.55	-0.19	+0.29	+0.78
Year	-0.22	-0.23	-0.27	-0.31	-0.36	-0.37	-0.34	-0.27	-0.03	+0.45	+0.74	+0.96
Summer <i>minus</i> year	+0.08	+0.10	+0.11	+0.15	+0.14	+0.12	+0.18	+0.35	+0.53	+0.46	+0.46	+0.18
Winter <i>minus</i> year	-0.08	-0.10	-0.11	-0.14	-0.13	-0.11	-0.18	-0.34	-0.52	-0.64	-0.45	-0.18

The differences "summer *minus* year" and "winter *minus* year" represent the semi-annual inequality, and have been thrown into curves on Table 25. On the same table we find likewise the annual and semi-annual curves drawn on the same axis, which is in each case the respective mean.

Before concluding this chapter on the hourly variations of the magnetic inclination, I have only to express my regret that it was not compatible with the means at my disposal to include in the present volume a discussion of the observations with a view to ascertain the lunar diurnal variation of the magnetic inclination, and likewise a discussion on the disturbances observed in this element. It is not improbable that, on a future occasion, the completion of what has here been given may be taken into consideration; and it could readily be carried into execution, for if but once the final normals were ascertained, the discussion of the lunar influence and disturbances could be proceeded with without any considerable difficulty.

V. ABSOLUTE OBSERVATIONS.

29. Whenever circumstances admitted, the magnetic elements were determined absolutely. As a rule this was done every second month, frequent deviations, however, having to be made, partly on account of my absence on the Magnetic Survey, partly for reasons clearly intelligible on considering the remarks made concerning the causes interfering with the working of the Observatory.

We propose treating of each of the magnetic elements separately: I. Magnetic Declination. II. Magnetic Horizontal Force. III. Magnetic Inclination. As there could not exist a doubt but that the local influence existing at the Flagstaff Observatory tended considerably to alter the values of each of the magnetic elements, the results for the two observatories were in the computation kept apart from one another.

I. MAGNETIC DECLINATION.

30. Determination of the Meridian or the Collimation of the circle. For this purpose the exact astronomical azimuths of several well-defined objects were ascertained, and by bearings taken towards them on each occasion when a determination of the absolute magnetic declination was intended, a mean value for the collimation of the circle was derived. In "Results I.," p. 236, we find the azimuths of three objects for the Flagstaff Observatory; and it remains only to add a few remarks respecting the azimuths of similar points of reference for the New Observatory.

As it was considered highly advisable that the azimuth determination made at the Flagstaff Observatory in the little brick tower ("R.I.," p. 216) should be compared with those made at the New Observatory, a stone pier was erected within the enclosure of the latter in such a position that bearings could be taken as well to the magnetic theodolite in the Absolute House as towards the brick tower above mentioned. In this way we were enabled to transfer the determination of the meridian, used in the reduction of the observations on the magnetic declination made at the Flagstaff Observatory, to the newly erected pier, on which an universal instrument was mounted. The absolute determination of the meridian, obtained by the aid of the latter, gave nearly the same results as that obtained by the transfer, so that we may rest assured that, whatever difference may exist between the absolute magnetic declination in the two localities, it is not attributable to a difference in the determination of the position of the astronomical meridian. The azimuth of the brick tower referred to from the centre of the stone pier was N. $40^{\circ}33'42''$ W.; the observations by which these results were obtained were made on the 11th and 12th of February, 1863.

The following azimuths were used in determining the collimation of the circle of the magnetic theodolite:

Chalmers Church	N. 4° 46' 13 E.
Weather Vane of the Anemometer at the Flagstaff Observatory*	N. 41° 31' 65 W.
Batman's Hill	N. 61° 38' 82 W.
Emerald Hill, Spire of the Orphan Asylum	S. 68° 11' 86 W.

Previous to the erection of the New Observatory, the theodolite was mounted for observations, made on the "Botanical Gardens Reserve" (site of the present Observatory), on the same line passing through the brick tower of the Flagstaff Observatory and the stone pier above mentioned, as it was at that time the practice to transfer the meridian from the former to the latter. The only exception to this was the observation made on the 26th of September, 1857, when the collimation of the circle was obtained by direct observation of the sun's altitude, the spot being, however, but a few yards to the South of the line just mentioned.

In "R. I.," pp. 236—242, we find everything relating to the manner in which the observations were made, and we must refer thereto for any information on this subject, as likewise on the mode of reduction of the observations, and a detailed account of the results of the observations on the absolute magnetic declination for the period between the 25th of February, 1857, and the 28th of February, 1859.

31. It has already been mentioned that the apparatus for determining the absolute magnetic declination was found to be not quite free from the presence of iron (p. 41); and that, on this account, it was indispensable to apply a correction of 2·94 min., by which the declination observed by the aid of the apparatus had to be diminished in order to obtain the real value. The amount of this influence it was not considered advisable to fix upon till after the instrument had again been compared with the Munich standard, which was effected in December, 1864.** On account of this correction we have to subtract 2·94 min. from all results of observations on the magnetic declination already published in "R. I.," pp. 241—243, whereby they will be made comparable with the results embodied in this volume.

Frequent observations on the magnetic declination were also made by means of the intensity apparatus, which however gave only differential results, as there was no arrangement for inverting the magnet, the collimation of the mirror having to be determined by the aid of the absolute apparatus, and the results therefore only representing values derived by mean of the latter. They were, accordingly, not included in the present discussion. When explaining the methods of observing at stations on the Magnetic Survey, we shall have to give a detailed account of the constants of this apparatus, and we withhold therefore any remarks thereupon for the present.

* This may also be taken as the astronomical bearing towards the house where formerly the absolute determinations were made, while the distance between the two observatories is 1·51 nautical miles.

** An apparatus, in which the thread of suspension was four feet long, and which was regarded as being perfectly free from the presence of iron, was also mounted in the Absolute House, and the results obtained by the aid of this instrument tended to prove the existence of the above mentioned influence.

32. Local Effect upon the Magnetic Declination at the Flagstaff Observatory. It has already been stated that, during the time of the working of the Flagstaff Observatory, it was exceedingly difficult to determine exactly the amount of local influence, on account of the continual alterations in the neighbourhood of the locality. On the 14th and 15th of September, 1858, a set of observations was made for the sole purpose of determining this local influence, and the magnetic theodolite was mounted in seven different places, all situate within a distance of 300 feet of the Absolute House. Four of these stations were selected on the meridian line passing through the transit, three being to the South and one to the North of the same; the other three stations were likewise on a North and South line, but on the West side of the cutting in King Street, the shortest distance between the two lines of stations being about 250 feet. If the declination at the Absolute House be taken as zero, the declination of the stations on the Eastern line, commencing with the Northernmost, were $+ 2^{\circ}24'$, $+ 20^{\circ}05'$, $+ 33^{\circ}54'$, and $+ 20^{\circ}07'$; and on the Western line, proceeding in the same order, $+ 27^{\circ}07'$, $+ 43^{\circ}83'$, and $+ 1^{\circ}26'72''$. It has already been mentioned in the Introduction (p. 4) that S. 40° W. of the Absolute House an iron house was erected, which was removed in February, 1859, and we recognize in it the principal cause of the above considerable deviations of the needle. But it is also obvious that it was scarcely possible to determine the exact amount of the magnetic declination in a locality where such serious influences existed, as the Absolute House also, though to a far smaller extent, was subjected to the same disturbing causes. It was, therefore, considered indispensable to establish a standard with regard to the value of the magnetic elements for Melbourne, and the Observatory Hill (site of the present Observatory) was considered, and subsequently proved to be, eminently suitable for that purpose. From observations made previous to the removal of the iron house and the alterations in the cutting of King Street, up to the month of May, 1860, the difference between the magnetic declination at the Flagstaff Observatory and at the Observatory Hill was adopted to be $11^{\circ}0'$, that of the latter locality exceeding that of the former; but subsequently, when *absolute determinations** on the value of the element in question could be effected at the Observatory Hill, this difference was proved to be less, amounting only to 2.69 minutes. This result was obtained by a comparison of the monthly means for October, November, December, January, and February, of the two years 1861—62 and 1862—63, disregarding the annual secular change.

33. We subjoin in this paragraph the results of all absolute observations on the magnetic declination, reduced to zero of the scale, and also to the mean reading of the declinometer for the day of observation. It is to be remarked, however, that some observations, the results of which were not satisfactory, either on account of some discrepancy in the torsion of the thread of suspension, or because the day of observation happened to be a disturbed one, have been rejected, and do therefore not appear in the subsequent enumeration. In examining the values, it must further be borne in mind that the scale division runs in the opposite direction after the month of October, 1860.

* Previously only observations with the differential apparatus had been made.

RESULTS OF THE OBSERVATIONS ON THE ABSOLUTE MAGNETIC DECLINATION. (1858--1864.)

YEAR.	DATE.	DECLINATION FOR		YEAR.	DATE.	DECLINATION FOR	
		Zero of the scale.	Mean of day of observation.			Zero of the scale.	Mean of day of observation.
1858	August 7 th	7°49'48E.	8°27'92E.	1861	September 26 th .	9°39'45E.	8°28'73E.
"	September 4 th ..	7°49'90	8°27'69	1862	February 14 th ..	9°41'04	8°29'63
"	November 25 th .	7°49'75	8°25'18	"	March 27 th	9°37'88	8°28'02
1859	January 25 th ...	7°45'57	8°28'32	"	September 4 th ..	9°41'38	8°27'95
"	April 21 st	7°48'80	8°27'27	"	" 9 th .	9°42'34	8°32'36
"	" 23 rd	7°49'59	8°26'58	"	December 7 th ...	9°53'37	8°33'53
"	June 7 th	7°52'38	8°27'06	1863	January 7 th	9°49'73	8°30'35
"	July 18 th	8° 3'36	8°22'54	"	" 10 th ...	9°47'71	8°27'30
"	September 10 th .	7°50'69	8°27'90	"	March 3 rd *	9°50'88	8°29'87
"	November 3 rd ..	7°41'85	8°25'81	"	April 3 rd *	9°49'00	8°28'19
"	December 24 th .	7°43'37	8°27'38	"	" 10 th *	9°49'53	8°30'21
1860	May 23 rd	7°43'37	8°26'98	"	May 12 th *	9°47'34	8°27'24
"	July 19 th	7°43'34	8°26'10	"	June 15 th *	9°50'30	8°28'85
1861	January 21 th ...	9°56'34	8°28'27	"	" 17 th *	9°51'23	8°28'78
"	" 22 nd ...	9°52'89	8°25'73	"	" 19 th *	9°49'15	8°27'71
"	February 25 th ..	9°52'15	8°24'50	"	August 8 th *	9°48'39	8°29'54
"	April 6 th	9°51'95	8°23'87	"	October 7 th * ...	9°49'99	8°28'76
"	June 28 th	9°36'47	8°24'03	"	November 19 th *	9°52'96	8°29'03
"	August 12 th	9°37'63	8°25'86	1864	March 23 rd * ...	9°51'49	8°28'45
1862	February 5 th ...	10° 5'22	8°22'20	"	April 22 nd *	9°50'63	8°27'36

In the above table the values have been arranged in two columns, the one to the left containing the values of the magnetic declination for the Flagstaff Observatory, the one to the right those for the Melbourne Observatory. The means for the days of observation to which an asterisk is attached have been derived by the aid of the hourly variation tables of the magnetic declination on page 46, as there were no hourly observations at command subsequent to the 1st of March, 1863. It may, however, be remarked that an inquiry was instituted with the view of determining the reliability of this mode of reduction to the mean of the day, it being also applied in such cases where complete observations were at command. The difference between the actual daily mean and that obtained by means of the variation table was, in all cases where no disturbance occurred, very small, and may, for want of anything more accurate, well be neglected. For obvious reasons I have thought it very desirable, in the present instance, to include also in the discussion observations made subsequently to the discontinuance of systematic registration at the Observatory, although I have made it a rule throughout this volume to confine my investigations to the period over which systematic registrations extend.

The means of the values in the two columns for the Flagstaff and Melbourne Observatories are, respectively, $8^{\circ}26'059$ E. and $8^{\circ}29'093$ E.; and as this arrangement likewise approximately divides the whole period of observation into two halves with regard to time (the exact middle being May, 1861) we may take the former value to apply till the end of October, 1859, and the latter to the end of the same month in 1862. If we now bear in mind that the difference between the two stations with regard to the value of the magnetic declination was ascertained to be $2'69$, we find that the actual difference in this element for the two periods indicated is $0'344$, a value of which we shall have to speak again hereafter. For May, 1861, the mean declination at the Melbourne Observatory would therefore be $8^{\circ}28'921$ E., and for the Flagstaff Observatory $8^{\circ}26'231$ E.

34. Annual Variation in the Magnetic Declination. By means of the tables on page 40, paragraph 6, we are enabled to derive a table representing the monthly mean values of the magnetic declination during the period from May, 1858, to February, 1863; and it is only to be added that the values in the second table, from October, 1862, to January, 1863, have yet to be diminished by the amount of the influence of the iron in the declination apparatus, viz. $2'94$, whereby these values become $52'48$ instead of $55'42$. In order to condense this table, we have omitted the 8 degrees, which accordingly must be added to each of the values below in order to obtain the monthly means of the magnetic declination.

MEAN MONTHLY VALUES OF THE EASTERLY MAGNETIC DECLINATION. (1858—1863.)

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1858	(28'47)	(29'01)	(29'21)	(27'90)	25'49	26'80	27'57	28'39	28'19	27'87	26'24	28'34	27'79
1859	29'69	30'45	31'10	28'39	(26'48)	26'77	24'92	24'34	24'78	26'94	27'03	27'60	27'37
1860	28'08	29'39	29'12	28'45	27'87	27'84	27'44	26'89	25'95	26'53	26'12	26'63	27'53
1861	27'64	27'78	27'70	26'67	24'86	24'92	27'22	27'55	28'34	28'35	28'05	28'14	27'27
1862	(28'47)	28'43	28'92	28'09	27'69	30'38	(26'79)	28'87	29'44	27'38	27'38	27'38	28'27
1863	29'05	29'05	—	—	—	—	—	—	—	—	—	—	—
1858 - 63	28'58	29'02	29'21	27'90	26'33	27'34	26'79	27'21	27'34	27'41	27'02	27'90	27'67

In order to make the values in this table at once comparable, the difference $2'69$ has been subtracted from the results for the months from October, 1862, to February, 1863, so as to reduce them to the same standard with those of the observations on the Flagstaff Hill. For months for which observations were wanting, approximate values were obtained by interpolation, which values are indicated by being enclosed within parentheses.

If we derive the general mean for the whole period from the above table, we find it to be $8^{\circ}27'67$ E., a value differing somewhat from that we have mentioned in the foregoing paragraph; for which difference, however, we can easily account, when we consider that the latter value was derived from all observations, while the former is only the mean result of about

40 days of observation, and moreover that the two values apply to different periods of observation, the former from May, 1858, to May, 1864, and the latter from May, 1858, to February, 1863.

Subtracting the mean for the whole period from the values for each month, we obtain the following series:

From April to September.		From October to March.	
April	+ 13".8	October	- 15".6
May	- 80".4	November	- 39".8
June	- 19".8	December	+ 13".8
July	- 52".8	January	+ 54".6
August	- 27".6	February	+ 81".0
September	- 19".8	March	+ 92".4
Mean	- 31".10	Mean	+ 31".20

On examining these values somewhat more closely, we observe considerable irregularities, although the mean annual variation is clearly established. These irregularities are doubtlessly attributable mainly to the high latitude of the place of observation, but in part also to the mode in which the results were derived, all observations having been included, whereas, in similar investigations, the larger disturbances are generally eliminated. The annual variation as derived from our observations, shows the greatest resemblance to that of the Cape of Good Hope, the resemblance extending even to the fact that the months of April and October are of the opposite algebraic sign to that of the groups to which they belong. The mean semi-annual deviation at the Cape is, for the months from April to September, equal to $-28''.7$, and for the months from October to March, $+30''.9$, values which very clearly correspond to those above given for Melbourne, viz. $-31''.1$ and $+31''.2$.

35. *Secular Change in the Magnetic Declination.* The frequent alterations in the instruments and the change in the locality of the Observatory cause the task of ascertaining the secular change, generally connected with many difficulties, to be in our case especially intricate. Under these circumstances, it has been thought advisable not to attempt an exact solution of the question, and for this reason I refrain from entering upon a strict examination of the weekly means in the magnetic declination throughout the whole period of observation, the plan usually followed, and shall confine myself to gleaning a few facts from our various tables calculated to throw some light upon the point at issue. Turning our attention first to the table showing the results of the observations on the absolute magnetic declination, we perceive that, at the Flagstaff Observatory, the declination *decreases* gradually from the 7th of April, 1858, to the 5th of February, 1862. For the Melbourne Observatory the space of time is too short to allow of any definite conclusion in this respect. During the years 1859 and 1863 the absolute determinations were the most frequent, and if we take the means for these years we have respectively $8^{\circ}26'60.7$ and $8^{\circ}26'12.9$, allowing in the latter case a correction of $-2'.69$ for the purpose of reducing the observations to those of the Flagstaff Observatory. This would likewise indicate a *decrease* of $0'.478$; while, on the other hand, if we take the two entire groups into consideration, we observe, as already mentioned, an *increase* of $0'.344$ for the period from the end of October, 1859, to the same time in 1862. This seems to indicate a change in the algebraic sign of the secular change within the period of observation. Let us see how far this is borne out by other and independent inquiries. The

table in paragraph 33 furnishes a means for examining into this matter, and we place on it the greater reliance, because the difference in the magnetic declination of the two observatories influences the result to a far less extent, and at the same time a far greater number of observations are taken into account. Taking the means for the single years, we notice on the whole a *decrease* in the magnetic declination down to the year 1861, and then a decided *increase* towards the year 1862, the latter being at the rate of about one minute per annum, which amount is in accordance with the views at present entertained with respect to the secular annual change of that part of Australia.* For the months of January and February alone hourly observations extending to the year 1863 are at our command; and on examining the results for these two months, we find (disregarding those for 1858, as obtained by interpolation, an uninterrupted *decrease* to 1861, and then in both cases an *increase* up to the end of the period during which hourly observations are on record. Judging from these months alone, the secular annual change would be, from January 1861 to 1862, and from 1862 to 1863, 0'83 and 0'58 respectively; and from February 1861 to 1862, and from 1862 to 1863, 0'65 and 0'62 respectively; on an average 0'67. The fact that the year 1861 is characterized as a turning point (secondary) in secular annual change of the magnetic declination is of particular interest, as it appears that at Kew also the same year seems to be distinguished for a check in the acceleration of the diminution of the Westerly declination. May it not be that a similar check acted upon the at any rate small increasing secular annual change at Melbourne, in such a manner as to cause a decrease of Easterly declination for a short time, in the same way as we know it to have been the case at the Cape of Good Hope** with regard to Westerly declination in the years 1840—43? After weighing all the evidence bearing upon this question, I feel disposed to answer it in the affirmative. The observations, however, which are at present being carried on at the Melbourne Observatory, will throw additional light upon this matter, so as to enable us, within a short space of time, to arrive at a definite conclusion.

II. MAGNETIC HORIZONTAL FORCE.

36. The apparatus employed in observing the horizontal component of our earth's magnetism has been fully described in the first publication issued by the Observatory ("R. I.," p.p. 218—235), and a complete set of observations, both deflections and oscillations, was there subjoined, in order to afford an opportunity of forming an opinion on the instruments and mode of observation adopted in the Flagstaff Observatory. There can naturally not exist any reason for repeating in the present volume what has already been stated, or even for giving in full the original observations on the horizontal intensity. It is, however, necessary to add that, subsequently to the year 1860, frequent observations were made by the aid of an apparatus

* Derived from the observations at Hobarton, and adopted in the construction of the magnetic chart of the Admiralty.

** Walker's "Terrestrial and Cosmical Magnetism," p. 21.

for determining the horizontal force by means of deflections "N. and S." and "E. and W." at two distances. This mode of observing, as well as the determining the moment of inertia of the various magnets by means of rings, was principally employed for the purpose of ascertaining the various factors of the magnets, No. 1 and No. 2. ("R. I.," p. 218.) Although observations on the horizontal component were also made and computed with several other magnets, I shall, in the following paragraphs, only subjoin the results derived from the two magnets named, to which I am particularly prompted by the fact that I had also an opportunity of determining again their constants at the Munich Observatory, where they had been observed previous to my departure for Australia in 1855 and 1856, thereby enhancing considerably the value of the results I am about to detail. These two magnets have also been invariably employed on the Magnetic Survey, the only exception being the short trip towards the Darling, when I accompanied Mr. Burke on his ever memorable expedition, and used the magnetic theodolite which formed part of his scientific outfit, so that these magnets had naturally to be the standard for this extensive work, and were likewise treated as such for the Observatory.

37. The constants and coefficients of magnets No. 1 and No. 2 have, as already stated, been determined both at Melbourne and Munich. The logarithmic constants were, for the various years of observation for each of the magnets found to be

			Magnet No. 1.			Magnet No. 2.
1855—56	...	...	0.78115	...	...	0.78651
1858	...	...	0.78094	...	...	0.78630
1859	...	...	0.78087	...	...	0.78623
1860	...	...	0.78079	...	...	0.78615
1861	...	...	0.78072	...	...	0.78608
1862	...	...	0.78065	...	...	0.78601
1863	...	...	0.78058	...	...	0.78594
1864	...	...	0.78051	...	...	0.78587

And the logarithmic equations by means of which the horizontal force was derived were as follows, if we repeat for the sake of comparison those already published in "R. I.," p. 218, and insert in these the various coefficients for temperature, expansion of brass and steel:

$$\begin{aligned}
 1856. \text{ No. 1 } & \dots \log X = 0.78115 - \log T - \frac{1}{2} \log \sin \phi - 0.95 t' + 8.15 (t - t') \\
 & \text{No. 2 } \dots \log X = 0.78651 - \log T - \frac{1}{2} \log \sin \phi - 0.95 t' + 8.81 (t - t') \\
 1864. \text{ No. 1 } & \dots \log X = 0.78051 - \log T - \frac{1}{2} \log \sin \phi - 0.94 t' + 8.15 (t - t') \\
 & \text{No. 2 } \dots \log X = 0.78587 - \log T - \frac{1}{2} \log \sin \phi - 0.94 t' + 8.81 (t - t')
 \end{aligned}$$

In these equations the temperature is given in Réaumur degrees.

As the horizontal force had frequently to be determined, particularly on the Survey, by means of deflections only, there being no determination of T (time of vibration, corrected for rate of chronometer, arc of vibration, torsion, and temperature) at command, we subjoin hereafter the values of μ (a quantity proportional to the magnetic moment of the deflecting magnet) as derived from the complete observations:

VALUES OF μ FOR MAGNETS No. 1 AND No. 2 DURING THE WHOLE PERIOD OF OBSERVATION.

DATE.		MAGNET No. 1.						DATE.		MAGNET No. 2.					
		$\log \sin \varphi$ — $\log T$	$f(t-t')$	$+0.94t'$	$t+t'$	t'	$\log \mu$			$\log \sin \varphi$ — $\log T$	$f(t-t')$	$+0.94t'$	$t+t'$	t'	$\log \mu$
1858	Aug. 19th	9.18236	+200	+11	+24.57	+11.62	9.18447	1858	Aug. 19th	9.29682	+209	+11	+23.75	+11.75	9.29902
"	Sept. 5th	18169	254	14	31.25	14.65	18437	"	Sept. 5th	29604	265	12	30.10	12.95	29881
"	Nov. 30th	18038	334	18	41.05	19.15	18390	"	Nov. 6th	29489	344	15	39.10	16.30	29848
1859	Jan. 31st	17890	325	18	39.90	19.75	18233	"	" 30th	29453	343	19	38.95	19.90	29815
"	Feb. 25th	17848	297	15	36.40	16.00	18160	1859	April 22nd	29224	212	14	24.12	14.60	29450
"	April 21st	17899	214	13	26.25	13.90	18126	"	June 7th	29156	209	11	23.75	11.55	29376
"	" 22nd	17896	201	13	24.70	13.35	18110	"	July 18th	29113	209	12	23.75	12.35	29334
"	June 7th	17877	200	12	24.55	13.15	18089	"	Sept. 12th	29028	257	14	29.15	14.40	29299
"	July 18th	17855	194	11	23.80	12.15	18060	"	" 20th	29067	214	11	24.35	11.50	29292
"	Sept. 12th	17823	229	12	28.05	12.95	18064	"	Nov. 3rd	28972	282	16	32.00	17.00	29270
"	" 20th	17802	208	11	25.60	11.60	18021	"	" 20th	28974	304	16	34.55	17.40	29294
"	Nov. 3rd	17727	260	16	31.85	16.65	18003	"	Dec. 25th	28886	247	12	28.05	13.30	29145
"	" 20th	17709	288	18	35.35	18.60	18015	1860	May 23rd	28696	271	15	30.75	16.00	28982
"	Dec. 25th	17636	224	13	27.55	13.70	17873	"	Dec. 31st	28272	418	24	47.40	25.00	28714
1860	May 23rd	17936	232	16	28.55	16.35	18184	1861	April 5th	28176	371	19	42.10	20.05	28566
"	Sept. 1st	17338	196	12	24.00	12.45	17546	"	July 22nd	28245	170	9	19.30	9.10	28424
"	Dec. 31st	17020	395	23	48.50	24.60	17438	"	Aug. 12th	28104	215	11	24.45	12.25	28330
1861	April 5th	16957	312	16	38.30	17.00	17285	"	Sept. 4th	28068	323	16	36.65	16.65	28407
"	" 5th	16927	336	18	41.20	19.25	17281	"	" 26th	27709	433	22	49.10	23.50	28164
"	July 22nd	16889	155	8	19.00	8.80	17052	1862	Feb. 5th	27705	293	16	33.55	17.30	28014
"	Aug. 12th	16926	196	11	24.00	12.00	17143	"	July 9th	27578	234	12	26.52	13.05	27824
"	Sept. 4th	16838	306	14	37.60	14.50	17158	"	Oct. 15th	27470	280	15	31.85	15.70	27765
"	" 26th	16483	417	22	51.25	23.25	16922	1863	Jan. 10th	27271	302	16	34.30	17.30	27589
1862	Feb. 5th	16392	274	16	33.70	17.20	16682	"	" 20th	27075	271	15	30.78	15.40	27361
"	July 9th	16280	216	12	26.52	13.05	16508	"	Mar. 3rd	27104	416	23	47.25	24.15	27543
"	Oct. 15th	16219	261	15	32.02	15.77	16495	"	" 7th	27208	333	18	37.80	19.40	27559
1863	Jan. 10th	15977	282	16	34.60	17.30	16275	"	June 7th	27143	236	13	26.77	14.10	27392
"	" 20th	15904	251	15	30.82	15.55	16170	"	Aug. 20th	27135	177	9	20.15	10.15	27321
"	Mar. 3rd	15790	392	23	48.07	24.77	16205	"	Oct. 8th	27055	223	12	25.30	12.30	27290
"	" 7th	15979	315	19	38.70	20.25	16313	"	Nov. 12th	26985	276	15	31.30	15.85	27276
"	June 7th	15791	218	13	26.82	14.00	16022	"	" 28th	27068	204	11	23.20	11.40	27283
"	Aug. 20th	15719	158	9	19.45	9.15	15886								
"	Oct. 8th	15619	202	11	24.85	11.55	15832								
"	" 8th	15631	209	11	25.70	12.15	15851								
"	Nov. 12th	15529	277	14	34.00	15.25	15820								
"	" 28th	15663	191	11	23.50	11.25	15865								

The values of the horizontal force are expressed in the metric unit in this paragraph, as will be the case throughout the whole book, unless when expressly stated to be otherwise.

By the aid of these values, an additional number of observations on the horizontal force made at various times, particularly during the year 1862, might have been included in the results about to be detailed, but as they will have to form part of the Magnetic Survey, I refrain from adding them here. When we compare the above values of μ with those already published in "R. I.," p. 234, we notice some slight differences, for which we can readily account by the fact that, on the former occasion, many results were included which had to be derived from observations made in the open air, while nearly all the above values were determined in the Observatory.

38. Local Effect on the Horizontal Force at the Flagstaff Observatory. At the time when an examination was instituted on the local effect upon the magnetic declination, the local effect upon the horizontal intensity was also examined. I refer, therefore, to paragraph 31, wherein a description of the various stations examined is given. Within the small compass indicated the values of the horizontal force showed the following differences when compared with the value (2.3602) observed in the Absolute House on the same day: + 0.0136, — 0.0022, + 0.0325, + 0.0110, + 0.0047, + 0.0065. It is evident that, with such differences in the immediate vicinity of the Observatory, it was scarcely possible to arrive at the exact values of the local effect of the horizontal force, and of the difference in value of this magnetic element as observed at the Flagstaff Hill and at the New Observatory. From various sets of observations, however, made in 1860 and 1862, as well as from a careful examination of the results at both localities, I feel myself justified in fixing this difference in horizontal force at 0.0130 (0.0281, British units), that at the Melbourne exceeding the one at the Flagstaff Observatory. In the year 1860 this difference was adopted to be only 0.073, which amount was derived from but a few observations, and is now, by a complete discussion of all the results bearing upon this question, proved to be too small by 0.0057.

Observations made within the enclosure of the present Observatory, and in its immediate vicinity, have proved this locality to be unobjectionable with regard to this point.

39. In the table below are embodied the results of the complete observations on the horizontal force, which have been made during the period from the 19th of August, 1858, to the 28th of November, 1863, rejecting however such observations as happened to be made on days of larger disturbances, and such as do not include both deflections and vibrations. Special attention, moreover, has been paid to the selection of such observations as are particularly adapted for the determination of the zero-points of the scale of the instruments for hourly registration.

RESULTS OF THE OBSERVATIONS ON THE MAGNETIC HORIZONTAL FORCE.

Expressed in Metric units (Gauss's). 1858—1863.

YEAR.	DATE.	HORIZONTAL FORCE FOR THE		YEAR.	DATE.	HORIZONTAL FORCE FOR THE	
		Time of observation.	Mean of day of observation.			Time of observation.	Mean of day of observation.
FLAGSTAFF OBSERVATORY.							
1858	August	19 th	2.3617	1861	July	22 nd	2.3523
"	"	19 th	2.3603	"	"	22 nd	2.3563
"	September	5 th	2.3603	"	August	12 th	2.3597
"	"	5 th	2.3612	"	"	12 th	2.3552
"	November	6 th	2.3562	"	September	25 th	2.3527
"	"	30 th	2.3614	"	"	25 th	2.3541
"	"	30 th	2.3603	1862	February	5 th	2.3585
1859	January	31 st	2.3633	"	"	5 th	2.3571
"	April	21 st	2.3618	NEW OBSERVATORY.			
"	June	7 th	2.3594	1861	September	4 th	2.3712
"	"	7 th	2.3613	"	"	4 th	2.3701
"	July	18 th	2.3620	1862	July	9 th	2.3633
"	"	18 th	2.3638	"	October	15 th	2.3628
"	September	12 th	2.3589	"	"	15 th	2.3627
"	"	12 th	2.3564	1863	January	10 th	2.3661
"	"	20 th	2.3612	"	"	10 th	2.3634
"	"	20 th	2.3603	"	"	20 th	2.3673
"	November	3 rd	2.3634	"	"	20 th	2.3661
"	"	3 rd	2.3627	"	March	3 rd	2.3658
"	"	20 th	2.3644	"	"	3 rd	2.3655
"	"	20 th	2.3641	"	"	7 th	2.3664
"	December	25 th	2.3631	"	June	7 th	2.3651
"	"	25 th	2.3614	"	"	7 th	2.3661
1860	May	23 rd	2.3613	"	August	20 th	2.3664
"	September	1 st	2.3594	"	"	20 th	2.3654
"	December	31 st	2.3572	"	October	8 th	2.3664
"	"	31 st	2.3567	"	"	8 th	2.3668
1861	April	5 th	2.3583	"	"	8 th	2.3672
"	"	5 th	2.3574	"	November	12 th	2.3648
"	"	5 th	2.3583	"	"	12 th	2.3652
				"	"	28 th	2.3682
				"	"	28 th	2.3690

* The means for the days to which asterisks are attached have not been derived from actual hourly readings of the differential instruments, but from the horary variation table on p. 99, as systematic registration extends only to the end of February, 1863. In a manner similar to that explained when detailing the results of the observations on the absolute magnetic declination (p. 144), this mode of reducing to the mean of the day of observation was proved to be reliable.

** Of all the observations which, for want of a proper building, had to be made in the open air, this is the only one received in the above table.

It scarcely requires any special mention that, during every one of the sets of observations from which the above results were derived, the instruments for hourly registration were concurrently read, thus affording a means of determining the zero-points of the scale of the instruments for hourly registration, of which I shall have to speak presently.

If we derive the means of the horizontal force from the single days of observation, and for each of the two Observatories separately, we have, for the Flagstaff Hill 2·35970 (5·11777, British units) corresponding to the beginning of May, 1860; and for the Melbourne Observatory 2·36666 (5·13286, British units), corresponding to the 20th of October, 1862. If we apply the difference in horizontal force in the two localities, we have, as a mean value for the whole period, for the Flagstaff Hill 2·35668 (5·11122, British units), and for the Melbourne Observatory, 2·36968 (5·13942, British units). These two latter values would consequently correspond to the beginning of April, 1861. In both cases we notice here a decided *decrease* of the horizontal force, on the Flagstaff Hill at the rate of 0·00276 per annum, whereas at the Melbourne Observatory it is but 0·00192 per annum, to which values we shall have again to refer.

40. Zero-point of the Scales of the Differential Instruments, and Monthly Values of the Horizontal Intensity derived therefrom. By means of the above observations, the zero-point of the scale has been determined as follows:

HORIZONTAL FORCE CORRESPONDING TO THE ZERO-POINT OF THE SCALE.

Throughout the whole period of observation.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1858	—	—	—	—	2·3621	2·3619	2·3619	2·3617	2·3613	2·3613	2·3609	2·3606
1859	2·3605	2·3606	2·3604	2·3603	2·3602	2·3598	2·3598	2·3596	2·3595	2·3592	2·3589	2·3591
1860	2·3585	2·3586	2·3586	2·3582	2·3581	2·3576	2·3577	2·3577	2·3574	2·3575	2·3569	2·3570
1861	2·3564	2·3565	2·3559	2·3561	2·3558	2·3562	2·3550	2·3550	2·3552	2·3551	2·3551	2·3546
1862	2·3542	2·3546	2·3539	2·3538	2·3539	2·3546	2·3532	2·3532	2·3657	2·3665	2·3666	2·3662
1863	3·3660	2·3657	—	—	—	—	—	—	—	—	—	—

Note: — The results for the months from September, 1862, to February, 1863, are to be understood to correspond to the results of the observations at the Melbourne Observatory.

The values of the above table, in conjunction with those of the table of monthly means of the horizontal force, all observations (p. 94), may be employed for the derivation of monthly means of the horizontal intensity. For this purpose the values referred to, on p. 94, have to be multiplied by 2·36,* in order to reduce them to absolute measure, as they are given in parts of the horizontal force. If the values thus reduced be added to the corresponding values of the zero-point, we obtain the subjoined table, in which the first four months in 1858 are obtained by interpolation:

* The complete value would be 2·35668, for which we may substitute the above approximation.

MONTHLY MEAN VALUES OF THE HORIZONTAL FORCE. (1858—1863.)

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1858	(2·36342)	(2·36332)	(2·36311)	(2·36291)	2·36280	2·36255	2·36236	2·36228	2·36209	2·36194	2·36179	2·36160
1859	2·36140	2·36126	2·36112	2·36088	2·36084	2·36062	2·36042	2·36035	2·36012	2·35989	2·35980	2·35962
1860	2·35936	2·35932	2·35907	2·35889	2·35876	2·35859	2·35838	2·35831	2·35808	2·35791	2·35778	2·35763
1861	2·35745	2·35729	2·35711	2·35694	2·35684	2·35659	2·35639	2·35631	2·35607	2·35589	2·35580	2·35557
1862	2·35541	2·35534	2·35507	2·35487	2·35486	2·35460	2·35394	2·35383	2·36662	2·36721	2·36709	2·36689
1863	2·36672	2·36664	—	—	—	—	—	—	—	—	—	—

Note: — The values for the months from September, 1862, to February, 1863, apply to the Melbourne Observatory, and in order to reduce them to the observations on the Flagstaff Hill, 0·01300 must be subtracted.

41. Secular Change in the Magnetic Horizontal Force. In order to investigate this important question in terrestrial magnetism, we express the values of the above table in British units by dividing them by 0·46108 (log 9·6637762).^{*} The values for the months from September, 1862, to February, 1863, are previously reduced to the standard of the Flagstaff Observatory by subtracting 0·01300, whereby the values in the subsequent table become at once comparable among themselves. The values for the first four months of 1858 are obtained by interpolation, and are therefore enclosed within parentheses.

MONTHLY MEAN VALUES OF THE MAGNETIC HORIZONTAL FORCE AT THE *FLAGSTAFF OBSERVATORY*.
(British units.)

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
1858	(5·12583)	(5·12562)	(5·12516)	(5·12473)	5·12449	5·12395	5·12354	5·12336	5·12295	5·12263	5·2230	5·12189	5·12387
1859	5·12145	5·12115	5·12085	5·12033	5·12024	5·11976	5·11933	5·11918	5·11868	5·11818	5·11798	5·11759	5·11956
1860	5·11703	5·11694	5·11640	5·11601	5·11573	5·11536	5·11490	5·11475	5·11425	5·11388	5·11360	5·11328	5·11518
1861	5·11289	5·11254	5·11215	5·11178	5·11156	5·11102	5·11059	5·11041	5·10989	5·10950	5·10931	5·10881	5·11087
1862	5·10846	5·10831	5·10772	5·10729	5·10727	5·10671	5·10527	5·10504	5·10466	5·10594	5·10568	5·10524	5·10647
1863	5·10487*	5·10470*	—	—	—	—	—	—	—	—	—	—	—
MEANS	5·11713	5·11691	5·11646	5·11603	5·11586	5·11536	5·11473	5·11455	5·11409	5·11403	5·11377	5·11336	5·11519

* The values for the two months of 1863 are not included in the respective general monthly means.

Should we desire to obtain the mean values of the horizontal force for the Melbourne Observatory, we have merely to add to the above values the constant 0·02810 (0·0130, Metric units). On examining the mean values for each year inserted in the last column, we perceive an uninterrupted decrease, at the mean rate of 0·00435 (0·00200, Metric units), a value which agrees well with the amount of annual decrease derived from the *single* observations, and mentioned at the end of paragraph 39, considering that we must attach the greater weight to the observations made at the Melbourne Observatory, those made at the Flagstaff Hill having been subjected to frequent interfering influences.

* This reduction is, of course, not necessarily required, but I take this opportunity of inserting also the results on the horizontal force in British units, for the sake of facilitating comparisons of the same with the results thereon of other observatories.

The line at the foot of the table contains the monthly means for the typical year of the period of observation. If we subtract these monthly means from the means of the respective months in the various years, as given in the above table, we obtain the following table of differences:

YEAR.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1858	+0.00870	+0.00871	+0.00870	+0.00870	+0.00863	+0.00859	+0.00831	+0.00881	+0.00886	+0.00860	+0.00853	+0.00853
1859	+0.00432	+0.00424	+0.00439	+0.00430	+0.00438	+0.00440	+0.00460	+0.00463	+0.00459	+0.00415	+0.00421	+0.00423
1860	—0.00010	+0.00003	—0.00006	—0.00002	—0.00013	—0.00000	+0.00017	+0.00020	+0.00016	—0.00015	—0.00017	—0.00008
1861	—0.00424	—0.00437	—0.00431	—0.00425	—0.00430	—0.00434	—0.00414	—0.00414	—0.00420	—0.00453	—0.00446	—0.00455
1862	—0.00867	—0.00860	—0.00874	—0.00874	—0.00859	—0.00865	—0.00946	—0.00951	—0.00943	—0.00809	—0.00809	—0.00812
1863	—0.01226	—0.01221	—	—	—	—	—	—	—	—	—	—

The gradual change in the differences from *plus* to *minus* clearly indicates the *decrease* of the horizontal force during the period of observation, proving in this way the existence of secular change in this magnetic element. If we adopt the above mentioned rate of decrease per annum, viz. 0.00200 (0.00435, British units), the annual decrease is 0.0008 of the horizontal force. The Hobarton observations give this rate of change as 0.0006, whereas at the Cape it was found to be 0.0061, of the horizontal force.

42. Semi-annual Variation in the Magnetic Horizontal Force. The general monthly means of the horizontal force, inserted at the bottom of the first table in paragraph 41, are naturally affected by the secular change, causing each consecutive month to decrease at the rate of 0.00036 (British units), wherefore we have to eliminate this amount by adding, in February 0.00036, in March 0.00072, in April 0.00108, etc. Carrying this out throughout the whole year, we have the following corrected monthly means in the horizontal force at the Flagstaff Observatory:

April	5.11711	October	5.11727
May	5.11730	November	5.11737
June	5.11716	December	5.11732
July	5.11689	January	5.11713
August	5.11707	February	5.11727
September	5.11697	March	5.11718

The general mean of these values is 5.11717, and if this mean value be subtracted from each of the monthly means, corrected for secular change, we have the following differences:

April	— 0.00006	October	+ 0.00010
May	+ 0.00013	November	+ 0.00020
June	— 0.00001	December	+ 0.00015
July	— 0.00028	January	— 0.00004
August	— 0.00010	February	+ 0.00010
September	— 0.00020	March	+ 0.00001
Means	— 0.00009	Means	+ 0.00009

Horizontal force during the months from October to March,	2·36068
" " " " April to September,	2·35915
Excess in Summer	0·00153

Horizontal force during the months from October to March,	2 36659
" " " " April to September,	2·36531
Excess in Summer	0·00128

In this latter case, the observations have not been freed from the effects of the secular change, it being quite unimportant, when compared with the amount of the excess; whereas the small amount obtained by an examination of the monthly tables, requires this correction to be applied, as otherwise the results derived from them, bearing upon the semi-annual variation, would be quite indefinite.

43. In "R. I.," pp. 244—248, a minute description has been given of the instruments used for determining the magnetic inclination, and also of the various modes of observation and reduction, several complete sets of observations being, for the sake of illustration, attached to the explanations referred to. There cannot, therefore, exist any occasion in the present volume for entering upon these matters. It may, however, be stated that I shall refrain from including in the present discussion any results derived by means of the differential inclinorium of Professor Lamont, although I have proved the results obtained by means of this excellent apparatus to be perfectly reliable, even when derived from observations made at stations so far apart as Melbourne and Munich ("R. I.," p. 248, par. 253). The results of my inquiry with respect to the value of this instrument for observing differences in the magnetic inclination, I shall have to detail when speaking of the instruments and modes of observation employed on the Magnetic Survey, as in that case the differential inclinorium was almost exclusively made use of.

44. We subjoin hereafter the results of the determination of the absolute magnetic inclination; in reading which it must be borne in mind that on nearly every occasion four needles were employed, and that each needle was twice observed, the poles being in each set inverted.

RESULTS OF THE OBSERVATIONS ON THE ABSOLUTE MAGNETIC INCLINATION. (1857—1864).

YEAR.	DATE.	LOCALITY.	INCLINATION.
1857	April 1 st and 4 th	Enclosure of the University	67° 3·22 South*
1858	September 2 ^d and 3 ^d ..	Flagstaff Observatory ...	67°18·09 "
1859	January 9 th and 12 th ...	" "	67°20·70 "
"	April 1 st	Enclosure of the University	67° 7·55 " *
"	September 21 st	Flagstaff Observatory ...	67°17·99 "
1860	June 10 th	" "	67°19·09 "
"	August 27 th	" "	67°20·06 "
1861	April 11 th	Melbourne Observatory ..	67° 8·17 " *
"	August 21 st	Flagstaff Observatory ...	67°20·92 "
1862	September 8 th	Melbourne Observatory ..	67° 5·47 "
1863	January 21 st	" "	67° 5·71 "
"	June 3 ^d and 6 th	" "	67° 7·42 "
"	August 11 th	" "	67° 7·00 "
"	October 2 ^d	" "	67° 7·30 "
1864	March 17 th to 22 ^d	" "	67° 9·15 "
"	June 17 th	" "	67° 9·82 "

Note. — The values to which an asterisk is attached have been derived or want of a proper building, from observations made in the open air.

45. Local Effect on the Magnetic Inclination at the Flagstaff Observatory. By frequent observations on the magnetic inclination, made within the enclosure of the Melbourne University, and in the reserve near the Botanical Gardens (site of the present Observatory), it was ascertained, that there was but a slight difference, if any, in the value of this magnetic element in the two localities. If we, therefore, take it for granted that the South inclination of the needle is the same in the two localities, and derive means for all observations made at the Flagstaff Observatory, and for all observations made in the enclosure of the University and in the Melbourne Observatory, we obtain the following results:

Mean at the Flagstaff Observatory for the period from the 2nd and 3rd
of September, 1858, to the 21st of August, 1861... .. 67°19·47 South.

Mean equivalent to that at the Melbourne Observatory for the period from the
3rd of April, 1857, to the 17th of June, 1864 67°6·97 South.

The middles of the two periods nearly coinciding, we may, in fixing the effect of local influence at 12'·50 (by which amount it is larger at the Flagstaff than at the Melbourne Observatory) well neglect the secular change, being, as it is, and as we shall presently see, but very small.

Localities in the vicinity of the Flagstaff Hill show great differences, while a close investigation at several stations near the Melbourne Observatory, manifest a great accordance, with respect to this magnetic element; so that we are fully justified in attributing the above excess to local influence exerted in the vicinity of the Flagstaff Hill, the more so as we have also observed similar irregularities to exist there in the other magnetic elements.

46. Mean Value and Secular Change of the Magnetic Inclination. If, by means of the value $12^{\circ}50'$, we correct the observations made at the Flagstaff Observatory, and then take a mean of all observations on the magnetic inclination for the period from the 1st of April, 1857, to the 11th of April, 1861, we have $67^{\circ}6'55''$ South, corresponding to April, 1859; and if we likewise take a mean for the period from the 21st of August, 1861, to the 17th of June, 1864, we have $67^{\circ}7'59''$ South, corresponding to the beginning of January, 1863. The general mean for the whole period of observation, corresponding to the beginning of October, 1860, is $67^{\circ}7'07''$ for Melbourne, and $67^{\circ}19'57''$ for the Flagstaff Observatory.

Glancing over the values of the table in the last paragraph, we notice a decided *increase* of the magnetic inclination, which becomes also apparent by the above mean values for April, 1859, and January, 1863, the amount being $1^{\circ}04'$, or about $0^{\circ}26'$ per annum, the period being, however, too short to arrive at a definite conclusion in this respect. If we assume the inclination for April, 1858, within the enclosure of the University, to have been equal to the mean value of the result of the observations in April 1857 and 1859, viz. $67^{\circ}5'15''$, and the mean value for the middle of May, 1864, to be $67^{\circ}9'48''$, we obtain an annual secular increase of $0^{\circ}70'$.

At Hobarton the magnetic inclination in the beginning of July, 1845, was $70^{\circ}36'01''$, and on my visit in April, 1864, I found it to be $70^{\circ}49'83''$, which would give an annual increase of $0^{\circ}73'$, a value differing but slightly from that which we derive from the Melbourne observations.

47. Semi-annual Variation of the Magnetic Inclination. The present paragraph contains the result of an inquiry instituted with the view of determining the semi-annual variation, for the understanding of which we must refer to the second table on page 134.

The considerable uncertainty connected with absolute observations on the magnetic inclination scarcely admits of an exact determination of the values corresponding to the zero-point of the scale by the usual mode of reading concurrently the differential instruments with those for the absolute determinations. We were therefore compelled to resort to a means for determining the values in question, which could only yield an approximation to the truth, although sufficiently accurate to guarantee the reliability of the following results. After a careful calculation of the probabilities, we fixed upon the following values for the zero-point of the scale at the various epochs of systematic registration:

From January, 1858, to October, 1860, $66^{\circ}51'93''$; from November, 1860, to June, 1862, $66^{\circ}48'85''$; for July, August, and September, 1862, $66^{\circ}50'98''$; and from October, 1862, to February 1863, $66^{\circ}51'11''$.

The values for the months from January to April, 1858, have been obtained by interpolation, and have been included in the general means. The values of the magnetic inclination corresponding to the zero-point of the scale during November, 1862, had to be increased by one minute, as there was an apparent discrepancy in the results for that month. In this way we obtained the subjoined monthly mean values for the whole period of observation:

April	...	...	...	67°5'46	October	...	...	...	67°5'72
May	...	...	...	67 5'30	November	...	...	...	67 5'59
June	...	...	...	67 5'36	December	...	...	...	67 5'53
July	...	...	...	67 5'43	January	...	...	...	67 5'82
August	...	...	...	67 5'38	February	...	...	...	67 5'92
September	..	...	...	67 5'35	March	...	...	...	67 5'56

These means have been corrected for secular change by subtracting from the mean for February 0'05, from that for March 0'10, etc., throughout the year.

The yearly mean derived from the above values is 67°5'54. If we subtract this value from each of the above monthly means, we have:

April	...	...	...	-0'06	October	...	...	...	+0'18
May	..	...	...	-0'22	November	...	...	...	+0'05
June	...	...	...	-0'16	December	...	...	...	-0'01
July	...	...	...	-0'09	January	...	...	...	+0'28
August	...	...	...	-0'14	February	...	...	...	+0'38
September	...	...	...	-0'17	March	...	...	...	+0'02
Mean for winter	...	...	...	-0'14	Mean for summer	...	...	...	+0'14

Here we have distinct evidence of a semi-annual variation in the magnetic inclination, to the effect that the South dip is above the mean when the sun's declination is South, and below the mean when North.

END OF PART II.

ADDENDA TO PART II.

In order to arrive at conclusions bearing upon the dependency of the hourly variation on the latitude of the place of observation, the idea was first suggested by Professor Lamont that each of the various terms of the equations expressing the solar diurnal variation in the three magnetic elements should be again developed into a series in which these terms should appear as periodical functions of the sun's mean longitude (λ), counting the same from the 15th of June.

With a view to assist such important inquiries, the terms of the interpolation series throughout the year, on pp. 48, 101, and 138, have been again treated according to Bessel's interpolation formula, and the results follow hereafter:

PAGE 48.

If the equation for the hourly variation in magnetic declination be expressed by

$$D^{(n)} = a + b \sin(n 15^\circ + B) + c \sin(n 30^\circ + C) + d \sin(n 45^\circ + D) + \dots$$

we have, with regard to the magnetic declination, the following equations for each term:

$$\begin{aligned} a &= 4.751 + 2.636 \sin(\lambda + 258^\circ 50') + 0.432 \sin(2\lambda + 256^\circ 4') + 0.316 \sin(3\lambda + 41^\circ 24') \\ &\quad + 0.255 \sin(4\lambda + 335^\circ 27') + \dots \\ b &= 2.486 + 1.199 \sin(\lambda + 249^\circ 17') + 0.129 \sin(2\lambda + 250^\circ 35') + 0.137 \sin(3\lambda + 8^\circ 22') \\ &\quad + 0.094 \sin(4\lambda + 281^\circ 40') + \dots \\ c &= 2.433 + 0.915 \sin(\lambda + 266^\circ 7') + 0.245 \sin(2\lambda + 246^\circ 28') + 0.104 \sin(3\lambda + 30^\circ 1') \\ &\quad + 0.322 \sin(4\lambda + 96^\circ 46') + \dots \\ d &= 1.238 + 0.472 \sin(\lambda + 264^\circ 10') + 0.217 \sin(2\lambda + 254^\circ 10') + 0.065 \sin(3\lambda + 41^\circ 16') \\ &\quad + 0.030 \sin(4\lambda + 47^\circ 44') + \dots \\ B &= 23^\circ 986 + 13^\circ 910 \sin(\lambda + 85^\circ 18') + 2^\circ 189 \sin(2\lambda + 93^\circ 43') + 0^\circ 649 \sin(3\lambda + 60^\circ 48') \\ &\quad + 2^\circ 513 \sin(4\lambda + 160^\circ 36') + \dots \\ C &= 0^\circ 836 + 2^\circ 289 \sin(\lambda + 244^\circ 32') + 6^\circ 254 \sin(2\lambda + 191^\circ 23') + 1^\circ 325 \sin(3\lambda + 16^\circ 24') \\ &\quad + 3^\circ 366 \sin(4\lambda + 354^\circ 20') + \dots \\ D &= 4^\circ 061 + 30^\circ 247 \sin(\lambda + 263^\circ 0') + 7^\circ 658 \sin(2\lambda + 163^\circ 30') + 1^\circ 336 \sin(3\lambda + 282^\circ 47') \\ &\quad + 4^\circ 005 \sin(4\lambda + 357^\circ 2') + \dots \end{aligned}$$

PAGE 101.

If the equation for the hourly variation in horizontal force be expressed by

$$HF^{(n)} = a' + b' \sin(n 15^\circ + B') + c' \sin(n 30^\circ + C') + d' \sin(n 45^\circ + D') + \dots$$

we have, with regard to the magnetic declination, the following equations for each term:

$$\begin{aligned} a' &= 8.318 + 3.493 \sin(\lambda + 258^\circ 23') + 1.030 \sin(2\lambda + 280^\circ 24') + 0.663 \sin(3\lambda + 53^\circ 20') \\ &\quad + 0.279 \sin(4\lambda + 63^\circ 20') + \dots \\ b' &= 3.967 + 1.474 \sin(\lambda + 251^\circ 24') + 0.784 \sin(2\lambda + 275^\circ 47') + 0.277 \sin(3\lambda + 82^\circ 57') \\ &\quad + 0.196 \sin(4\lambda + 48^\circ 15') + \dots \\ c' &= 2.762 + 0.841 \sin(\lambda + 265^\circ 38') + 0.265 \sin(2\lambda + 293^\circ 34') + 0.235 \sin(3\lambda + 47^\circ 25') \\ &\quad + 0.141 \sin(4\lambda + 165^\circ 10') + \dots \\ d' &= 1.525 + 0.462 \sin(\lambda + 280^\circ 51') + 0.112 \sin(2\lambda + 43^\circ 12') + 0.189 \sin(3\lambda + 11^\circ 11') \\ &\quad + 0.114 \sin(4\lambda + 95^\circ 1') + \dots \\ B' &= 245^\circ 530 + 38^\circ 498 \sin(\lambda + 284^\circ 13') + 7^\circ 129 \sin(2\lambda + 227^\circ 38') + 3^\circ 576 \sin(3\lambda + 31^\circ 34') \\ &\quad + 6^\circ 414 \sin(4\lambda + 15^\circ 30') + \dots \\ C' &= 261^\circ 056 + 43^\circ 557 \sin(\lambda + 255^\circ 0') + 8^\circ 171 \sin(2\lambda + 179^\circ 50') + 8^\circ 802 \sin(3\lambda + 7^\circ 10') \\ &\quad + 1^\circ 188 \sin(4\lambda + 160^\circ 23') + \dots \\ D' &= 292^\circ 918 + 43^\circ 521 \sin(\lambda + 239^\circ 51') + 26^\circ 998 \sin(2\lambda + 174^\circ 12') + 8^\circ 495 \sin(3\lambda + 179^\circ 54') \\ &\quad + 5^\circ 072 \sin(4\lambda + 198^\circ 1') + \dots \end{aligned}$$

PAGE 138.

If we treat the horary variation in magnetic inclination in the same manner, we have:

$$\begin{aligned} a'' &= 0.707 + 0.030 \sin(\lambda + 74^\circ 35') + 0.172 \sin(2\lambda + 78^\circ 14') + 0.150 \sin(3\lambda + 265^\circ 1') \\ &\quad + 0.039 \sin(4\lambda + 87^\circ 4') + \dots \\ b'' &= 0.611 + 0.067 \sin(\lambda + 117^\circ 19') + 0.007 \sin(2\lambda + 261^\circ 52') + 0.097 \sin(3\lambda + 235^\circ 30') \\ &\quad + 0.031 \sin(4\lambda + 250^\circ 58') + \dots \\ c'' &= 0.433 + 0.059 \sin(\lambda + 196^\circ 36') + 0.017 \sin(2\lambda + 147^\circ 16') + 0.019 \sin(3\lambda + 220^\circ 55') \\ &\quad + 0.037 \sin(4\lambda + 254^\circ 29') + \dots \\ d'' &= 0.202 + 0.013 \sin(\lambda + 327^\circ 32') + 0.009 \sin(2\lambda + 144^\circ 28') + 0.032 \sin(3\lambda + 18^\circ 26') \\ &\quad + 0.011 \sin(4\lambda + 228^\circ 49') + \dots \\ B'' &= 93^\circ 431 + 60^\circ 213 \sin(\lambda + 259^\circ 4') + 13^\circ 359 \sin(2\lambda + 154^\circ 5') + 7^\circ 125 \sin(3\lambda + 287^\circ 10') \\ &\quad + 2^\circ 881 \sin(4\lambda + 107^\circ 32') + \dots \\ C'' &= 102^\circ 078 + 56^\circ 859 \sin(\lambda + 255^\circ 45') + 14^\circ 927 \sin(2\lambda + 188^\circ 40') + 6^\circ 840 \sin(3\lambda + 332^\circ 39') \\ &\quad + 7^\circ 374 \sin(4\lambda + 68^\circ 24') + \dots \\ D'' &= 115^\circ 05 + 867^\circ 789 \sin(\lambda + 248^\circ 8') + 27^\circ 044 \sin(2\lambda + 225^\circ 41') + 14^\circ 674 \sin(3\lambda + 343^\circ 10') \\ &\quad + 14^\circ 671 \sin(4\lambda + 183^\circ 23') + \dots \end{aligned}$$

The equation for the hourly variation in the magnetic inclination is, in this case, supposed to be

$$I^{(n)} = a'' + b'' \sin(n 15^\circ + B'') + c'' \sin(n 30^\circ + C'') + d'' \sin(n 45^\circ + D'') + \dots$$

APPENDIX.

DAY OF MONTH.	TEMPERATURE OF AIR.			PRESSURE OF AIR.			PRESSURE OF VAPOR.		RELATIVE HUMIDITY.	TEMPERA- TURE OF DEW POINT.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Range.	Mean.	Mean.
1863				inches.	inches.	inches.	inches.	inches.	(0-1)	°
1. JANUARY.										
1	67.8	78.2	59.0	29.641	29.914	29.440	0.345	0.146	0.509	48.8
2	63.8	73.3	50.8	29.980	30.050	29.899	0.356	0.147	0.612	49.6
3	75.9	99.9	52.8	29.826	29.932	29.716	0.377	0.231	0.505	51.2
4	68.4	78.8	60.9	29.668	29.834	29.466	0.515	0.087	0.741	59.8
5	63.9	70.8	54.3	29.810	29.979	29.623	0.401	0.254	0.675	52.9
6	62.3	71.0	52.0	29.972	30.019	29.940	0.351	0.094	0.644	49.2
7	76.4	99.0	51.7	29.860	29.950	29.762	0.388	0.125	0.528	52.0
8	86.5	104.6	65.7	29.707	29.819	29.587	0.386	0.087	0.354	51.9
9	74.7	95.1	59.8	29.713	29.937	29.535	0.404	0.225	0.454	53.1
10	63.2	69.8	57.0	29.958	29.992	29.924	0.357	0.140	0.619	49.7
11	65.8	77.2	57.0	29.959	30.010	29.916	0.432	0.066	0.692	—
12	64.1	70.8	57.0	29.992	30.055	29.932	0.392	0.100	0.658	52.3
13	72.9	94.6	54.6	29.803	29.928	29.635	0.461	0.211	0.619	56.7
14	71.3	81.0	65.0	29.673	29.776	29.564	0.602	0.126	0.804	64.2
15	71.4	85.2	58.1	29.532	29.750	29.455	0.501	0.254	0.643	59.1
16	63.4	73.3	53.0	29.865	29.970	29.776	0.354	0.082	0.636	49.5
17	63.6	72.1	57.7	30.020	30.074	29.958	0.358	0.138	0.616	49.8
18	62.9	74.0	50.1	29.900	30.032	29.816	0.376	0.148	0.655	51.2
19	64.8	74.1	60.2	29.811	29.837	29.777	0.445	0.133	0.715	55.8
20	61.8	63.5	59.8	29.859	29.896	29.804	0.422	0.123	0.761	54.3
21	73.4	88.4	57.4	29.775	29.855	29.667	0.504	0.187	0.663	59.3
22	81.8	94.9	68.0	29.694	29.773	29.604	0.418	0.332	0.409	54.0
23	72.3	93.5	63.0	29.599	29.630	29.566	0.493	0.249	0.585	58.7
24	67.7	74.8	61.9	29.567	29.673	29.431	0.524	0.152	0.785	60.3
25	66.1	75.8	57.1	29.469	29.689	29.353	0.446	0.250	0.719	55.8
26	62.7	72.8	54.4	29.830	29.910	29.711	0.384	0.114	0.696	51.7
27	64.2	74.6	55.0	29.955	30.034	29.893	0.387	0.097	0.667	52.0
28	64.4	72.4	58.8	30.021	30.068	29.991	0.348	0.067	0.586	49.0
29	62.7	68.1	58.7	29.990	30.029	29.900	0.344	0.044	0.612	48.7
30	63.9	70.8	56.0	30.034	30.074	29.997	0.365	0.051	0.614	50.3
Means . .	68.14	79.8	57.6	29.816	29.9163	29.7213	0.415	0.1486	0.625	53.6
2. FEBRUARY.										
Jan. 31	69.6	89.7	50.5	29.941	30.014	29.869	0.410	0.198	0.630	53.5
1	83.2	103.9	60.0	29.837	29.925	29.746	0.315	0.290	0.312	46.3
2	88.0	104.0	68.0	29.663	29.735	29.540	0.370	0.298	0.314	50.7
3	66.0	72.5	59.2	29.743	29.775	29.717	0.457	0.177	0.730	56.5
4	63.9	76.6	56.0	29.748	29.892	29.676	0.373	0.089	0.651	50.9
5	59.8	68.8	51.0	30.018	30.079	29.903	0.304	0.102	0.606	45.4
6	63.1	72.1	53.1	30.067	30.104	30.035	0.357	0.121	0.626	49.7
7	64.3	72.9	57.8	29.966	30.049	29.884	0.408	0.095	0.687	53.4
8	65.3	77.6	58.7	29.818	29.877	29.750	0.422	0.100	0.701	54.3
9	60.8	66.9	55.0	29.963	30.110	29.883	0.322	0.107	0.621	49.9
10	60.7	70.9	50.7	30.095	30.143	30.058	0.339	0.158	0.629	48.3
11	63.8	76.3	54.0	30.014	30.066	29.947	0.424	0.107	0.737	54.4
12	64.7	71.9	59.0	29.995	30.037	29.952	0.425	0.083	0.711	54.5
13	67.7	78.9	53.0	29.939	29.984	29.895	0.475	0.225	0.722	57.6
14	74.9	90.6	59.6	29.848	29.923	29.755	0.539	0.147	0.663	61.1
15	70.1	79.1	64.0	29.773	29.845	29.712	0.586	0.117	0.796	63.5
16	69.8	78.4	66.1	29.615	29.724	29.522	0.629	0.090	0.860	65.5
17	65.5	68.8	62.9	29.590	29.664	29.506	0.573	0.106	0.914	62.8
18	62.5	64.2	61.4	29.588	29.672	29.516	0.521	0.057	0.916	60.2
19	62.4	65.9	60.0	29.729	29.817	29.653	0.449	0.082	0.805	56.0
20	61.9	69.4	57.2	29.875	29.922	29.797	0.440	0.050	0.812	55.5
21	63.5	72.1	57.7	29.911	29.951	29.881	0.426	0.128	0.738	54.5
22	67.3	82.3	53.0	29.802	29.883	29.701	0.480	0.178	0.742	57.9
23	69.9	79.9	62.8	29.605	29.698	29.537	0.570	0.197	0.778	62.7
24	68.1	77.1	63.1	29.695	29.812	29.607	0.583	0.245	0.859	63.4
25	64.2	73.4	60.5	29.835	29.868	29.786	0.370	0.108	0.625	50.7
26	61.8	69.9	56.0	29.826	29.872	29.796	0.353	0.145	0.665	49.4
27	59.8	65.8	55.2	29.898	29.948	29.852	0.311	0.066	0.598	46.0
28	58.9	66.6	51.7	30.039	30.090	29.943	0.299	0.062	0.592	45.0
March 1	67.9	84.5	49.9	30.046	30.060	29.810	0.328	—	0.486	46.6
Means . .	66.31	76.4	57.6	29.849	29.917	29.774	0.429	0.1354	0.684	54.2

Height above the Sea 91.3 feet.

WIND.					TEMPERATURE OF SOIL.						RADIATION.	
DIRECTION.			FORCE.		SURFACE.		MEAN.				Max.	Min.
Mean.	Extreme from	Extreme to	Mean.	Range.	Mean.	Range.	14 in. deep.	3ft. deep.	6ft. deep.	8ft. deep.	Solar.	Terrestrial.
265 14	N. by E.	S.	2.6	4.0	72.5	28.0	72.3	69.9	66.7	63.8	110.7	—
337 13	N. W.	S. E. by E.	1.4	2.9	77.8	51.3	70.9	70.1	66.9	64.0	102.0	45.8
327 23	N. E. by N.	S.	1.5	4.0	86.3	63.8	71.9	70.2	67.1	64.2	128.6	47.7
310 23	N. W. by W.	S. by W.	1.0	3.0	79.1	34.0	73.9	70.8	67.2	64.3	108.2	—
340 11	W. by N.	S. E.	2.5	3.5	73.0	35.6	72.5	71.3	67.4	64.4	104.1	—
1 6	E. S. E.	S. W.	2.1	4.0	74.4	43.0	71.1	71.0	67.1	64.5	101.1	49.4
135 57	S. by W.	N. by W.	1.0	3.0	86.3	62.4	71.4	70.6	67.8	64.5	123.9	45.3
173 31	N. E.	N. by W.	2.1	4.5	94.1	59.7	75.0	72.5	67.9	64.8	129.9	58.9
329 18	N. by E.	S. S. E.	3.8	3.0	84.1	38.9	77.2	72.7	68.0	64.6	121.0	—
6 35	S. E.	S. S. W.	3.5	5.5	77.8	39.2	75.3	73.3	68.2	64.9	103.0	53.7
3 32	S. E.	S. S. W.	2.9	4.5	74.9	38.2	73.5	72.8	68.4	64.9	104.3	54.0
352 42	S. E.	S. S. W.	2.4	5.0	77.8	40.3	72.9	72.2	68.6	65.0	101.7	53.7
59 41	All round		1.1	4.0	78.4	50.6	72.7	72.1	68.7	65.2	122.1	49.8
168 30	E.	N. by W.	1.7	5.0	72.3	14.6	72.1	72.1	68.9	65.8	113.3	—
230 5	N. E.	S. by E.	3.4	5.5	74.8	26.4	71.3	71.9	68.9	65.3	115.2	63.8
329 5	N. N. W.	S. E. by E.	0.9	1.9	74.9	39.5	70.4	71.6	68.9	65.4	115.5	47.0
341 1	E. S. E.	W. N. W.	2.0	4.0	75.4	33.6	71.5	71.2	68.8	65.3	105.9	—
347 48	All round		2.0	4.5	75.3	39.2	71.3	71.2	68.9	65.5	106.0	44.1
324 32	W. by S.	S.	3.6	5.0	73.8	26.1	71.4	71.2	69.0	65.6	106.0	59.0
354 26	S. by E.	S. W. by W.	2.3	3.5	66.2	4.4	70.5	71.0	68.9	65.8	83.7	59.1
26 29	S. W.	N.	0.8	3.0	82.7	49.4	70.1	70.2	68.8	65.7	114.4	52.8
163 49	All round		1.9	4.0	90.0	48.4	73.7	70.8	68.9	65.9	124.4	—
358 49	All round		2.4	5.0	83.9	42.6	76.2	72.1	68.6	66.0	122.0	62.7
41 1	All round		1.0	4.0	68.9	13.0	73.4	73.1	69.0	66.0	94.2	60.5
225 35	S. W.	N.	3.6	6.0	67.8	19.3	70.7	72.1	68.9	65.9	111.3	62.1
284 41	W.	S.	2.8	7.0	68.3	34.0	68.5	71.2	69.2	65.9	101.9	53.5
346 47	W. by N.	E. S. E.	1.9	4.0	73.3	37.2	69.1	70.4	69.3	66.1	105.0	51.8
2 57	E. S. E.	S. S. W.	1.4	3.0	73.9	29.0	70.5	70.3	69.3	66.2	101.5	59.0
356 59	S. E.	S. W.	1.5	2.5	75.0	31.0	71.1	70.3	69.1	66.2	102.9	57.6
357 30	S. E.	S. W. by S.	1.8	3.9	75.2	31.9	71.6	70.5	69.0	66.1	102.2	56.1
—	—	—	2.09	4.09	76.9	36.8	72.1	71.3	68.4	65.2	109.5	54.2
358 3	All round		0.7	2.0	81.0	48.6	71.6	70.7	69.0	66.3	110.1	44.4
176 14	E.	W. by N.	1.9	6.0	89.0	55.9	74.2	71.3	69.1	66.5	133.0	56.6
185 19	N. E.	S. S. E.	3.9	6.5	93.0	45.5	77.0	72.3	69.0	66.4	129.0	72.1
9 11	S. by W.	E.	1.5	3.5	72.5	20.4	76.5	73.7	69.2	66.5	118.4	61.4
329 3	All round		2.3	7.0	72.8	36.5	72.9	73.6	69.4	66.5	105.6	51.8
316 51	W.	E. S. E.	2.8	4.0	70.2	35.0	71.6	72.7	69.6	66.5	104.4	48.7
328 57	W. N. W.	S. E. by E.	1.3	2.0	74.1	38.4	71.3	71.5	69.5	66.2	105.3	—
26 51	E. S. E.	S. W.	0.8	2.0	72.0	19.8	71.5	71.5	69.7	66.7	90.3	56.9
343 16	E. S. E.	S. W.	1.7	5.0	75.5	34.3	71.0	71.3	69.8	66.8	112.2	54.6
325 55	W.	S. S. W.	3.6	5.0	70.2	26.9	71.2	71.1	69.7	66.7	100.9	52.6
319 10	All round		0.8	1.5	71.9	40.5	70.0	70.3	69.5	66.8	102.2	46.2
1 15	All round		1.1	4.0	76.8	43.2	70.6	70.8	69.4	66.8	104.5	50.0
353 39	E. S. E.	S. W.	1.5	4.0	75.7	32.7	71.6	70.9	69.6	66.8	109.2	52.7
358 0	All round		0.7	2.0	78.9	45.5	71.8	71.2	69.5	66.9	108.9	49.8
7 10	All round		0.8	2.0	84.6	45.6	73.0	71.2	69.3	66.7	113.7	55.6
317 15	N.	S.	1.4	3.5	79.6	35.6	74.4	72.0	69.4	66.9	107.4	57.9
10 54	W.	S. E.	1.3	3.9	73.4	12.0	74.2	72.6	69.5	66.9	107.7	57.9
10 46	S. E.	S. S. W.	2.1	3.0	67.1	6.2	70.8	72.6	69.8	67.0	79.4	61.7
359 0	S.	S. by W.	4.3	3.0	64.3	4.8	68.2	71.7	69.8	67.1	71.4	—
303 32	S.	W.	4.2	4.0	62.5	4.8	66.6	70.1	69.8	66.9	79.1	—
307 45	W. by N.	S. E.	1.1	1.5	63.5	11.8	65.4	69.3	69.8	66.9	85.3	56.5
338 40	S. E.	W.	1.1	3.0	65.6	20.8	65.4	67.5	69.4	67.0	104.9	55.9
26 50	N. N. E.	S. W.	0.6	2.0	72.1	33.7	66.3	67.8	69.0	66.4	110.1	48.9
170 16	N. W.	E. N. E.	1.4	4.0	69.4	11.1	67.8	68.4	69.0	67.0	109.8	57.7
358 23	All round		1.3	4.0	70.1	19.8	68.3	68.9	68.9	67.1	105.2	61.6
346 29	S. W.	S.	2.2	2.0	67.7	19.9	67.6	69.0	68.7	67.0	104.0	58.7
316 4	W. by N.	S.	3.2	4.0	65.8	16.5	66.7	68.7	68.5	66.7	102.0	57.9
335 12	S. W.	S.	5.8	4.0	63.4	17.8	65.5	68.3	68.6	67.1	98.1	54.0
347 13	W. by S.	E. S. E.	1.5	6.0	65.4	29.3	65.1	67.1	68.3	66.7	96.2	47.9
—	—	—	1.0	—	70.5	—	—	—	—	—	—	43.2
—	—	—	1.95	3.60	72.6	28.3	70.3	70.6	65.8	66.7	103.7	54.8

DAY OF MONTH.	AMOUNT OF CLOUD.			GENERAL FORM OF CLOUDS.	ELECTRIC TENSION.			OZONE.		HOURS OF				
	Mean	Max.	Min.		Positiv Mean.	Numbre of Registrations.		Day.	Night.	Fog.	Dew.	Hail.	Rain.	
						Negative.	0							
1863.	(0-10)	(0-10)	(0-10)											
1. JANUARY.	1	6.5	4	0	Nim., Cum. Str., Cum.	—	—	—	1.0	3.0	0	0	0	0.7
	2	1.8	9.5	0	Cum Str., Cir., Cir Cum.	—	—	—	2.0	3.0	0	0.2	0	0
	3	3.4	10.	0	Str., Cir. Str., Clear.	—	—	—	2.0	4.0	0	4.0	0	0
	4	9.6	10.	8	Cir. Cum., Cum. Str., Veil and Nim	—	—	—	5.0	7.0	0	0	0	0.4
	5	6.4	4.	0.5	Cum. Str., Nim and Cir. Str.	—	—	—	6.0	9.0	0	0	0	2.9
	6	4.2	10.	0	Cum., Cir., Cum. Str.	—	—	—	2.0	4.0	0	0	0	0
	7	1.1	7	0	Clear and Veil.	—	—	—	1.0	2.0	0	6.0	0	0
	8	0.3	4.0	0	Clear, Str., Veil.	—	—	—	0.5	2.0	0	0	0	0
	9	4.9	10	0	Clear, Cum. Str., Cir. Str., Cir.	—	—	—	4.0	1.5	0	0	0	0.8
	10	6.7	10	2	Cum. Str., Nim., Cir. Cum.	—	—	—	2.0	8.0	0	0	0	0
	11	8.3	10	0	Cum. Str. Veil.	—	—	—	4.7	3.0	1.5	4.0	0	0.2
	12	4.4	10	0	Cum. Str., Thin. Veil Clear.	—	—	—	1.0	8.0	0	0.5	0	0
	13	6.2	10	0	Cir. Str. Veil, Nim.	—	—	—	2.0	6.0	3.0	5.3	0	2.5
	14	8.5	10	3	Nim., Cir. Cum., Cum. Str.	—	—	—	5.0	10.0	0	0	0	9.5
	15	7.8	10	2	Cum. Str., Nim., Cir. Str.	—	—	—	6	8.0	0	0	0	0.1
	16	2.9	9.9	0.2	Cum. Str., Cum.	—	—	—	1.0	6.0	0	0	0	0.0
	17	5.6	10	1	Nim., Cum. Str., Cir, Cir. Cum.	—	—	—	2.0	4.0	0	0	0	0.4
	18	6.0	10	2	Cum. Str., Cir. Str., Cir. Cum, Veil	—	—	—	1.0	2.0	2.0	2.0	0	0
	19	9.3	10	7	Veil, Cum. Str., Nim.	—	—	—	6.0	7.0	0	0	0	0.1
	20	9.9	10	8	Cum. Str., Nim.	—	—	—	6.0	4.0	0	0	0	0.8
	21	1.3	4	0	Cum. Str., Cum.	—	—	—	2.0	4.0	0	5.0	0	0
	22	1.5	4	0	Cum. Str., Cir. Str., Veil.	—	—	—	0.5	1.0	0	0	0	0
	23	7.0	10	1	Cum. Str., Nim.	—	—	—	1.0	2.0	0	0	0	1.0
	24	8.9	10	5	Cum. Str., Nim. and Cir. Cum.,	—	—	—	8.0	8.0	0	0	0	5.1
	25	9.1	10	5	Cum. Str., Nim.	—	—	—	5.0	8.0	0	0	0	5.4
	26	6.9	10	1	Nim., Cum. Str. and Cir Cum.	—	—	—	2.0	1.0	0	0	0	0
	27	7.5	10	2	Cum. Str.	—	—	—	1.2	5.8	0	0	0	0
	28	9.3	10	6	Cum. Str., Veil.	—	—	—	1.0	1.0	0	0	0	0
	29	6.2	10	0.5	Veil, Cum. Str.	—	—	—	3.0	5.0	0	0	0	0
	30	4.8	10	0	Cum. Str., Clear.	—	—	—	2.0	3.0	0	0.5	0	0
Means . .	5.87	8.9	1.8		—	—	—	2.9	4.7	6.5	27.5	0	29.9	
2. FEBRUARY.	(0-10)	(0-10)	(0-12)											
	Jan. 31	0.1	1	0	Str., Clear	—	—	—	1.0	5.0	0	6.0	0	0
	1	0.0	6	0	Cum., Clear.	—	—	—	1.0	6.0	0	3.7	0	0
	2	2.6	10	0	Cum., Cum. Str., Cir Cum.	—	—	—	2.0	0.0	0	0	0	0.5
	3	7.2	10	1	Nim., Cum. Str., Veil.	—	—	—	5.0	8.0	0	0	0	0.8
	4	7.1	10	1	Cum. Str., Nim.	—	—	—	2.0	6.0	0	0	0	1.2
	5	5.5	10	0.5	Cum. Str.	—	—	—	2.0	5.0	0	0	0	0
	6	5.5	10	0.5	Cir Str., Cum., Cum. Str.	—	—	—	1.0	4.0	0	0	0	0
	7	8.4	10	2	Cum. Str. Veil, Cir.	—	—	—	2.0	5.0	0	0.5	0	0
	8	7.5	10	0.1	Cum. Str., Cir. Str., Cum.	—	—	—	3.0	7.0	0	0	0	0
	9	6.0	10	1	Cum., Cum. Str., Cir.	—	—	—	3.0	5.0	0	0	0	0
	10	4.0	10	0	Cum. Str., Cum.	—	—	—	0.5	3.0	0	1.0	0	0
	11	3.4	10	0	Cum. Str.	—	—	—	2.0	6.0	0	3.5	0	0
	12	4.7	10	0	Cum. Str. Clear	—	—	—	4.0	7.0	0	3.5	0	0
	13	0.3	4	0	Cum., Clear	—	—	—	1.0	2.0	0	4.5	0	0
	14	0.7	5	0	Cum., Misty Veil. Clear	—	—	—	2.0	—	0	6.0	0	0
	15	4.8	10	0	Cum., Str. Veil, Scud.	—	—	—	2.0	3.0	0	5.0	0	0
	16	10.0	10	10	Nim.	—	—	—	6.0	7.0	0	0	0	10.7
	17	10.0	10	9.5	Nim.	—	—	—	9.0	8.0	0	0	0	22.5
	18	10.0	10	10	Nim.	—	—	—	10.0	10.0	0	0	0	23.2
	19	9.8	10	7	Nim., Cum. Str., Cir.	—	—	—	8.0	10.0	0	0	0	5.1
	20	9.9	10	8	Cum. Str., Nim.	—	—	—	9.0	10.0	0	0	0	3.2
	21	6.7	10	0	Nim, Cum. Str., Cir. Str.	—	—	—	3.0	8.0	0	1.5	0	1.0
	22	3.4	10	0	Cir., Cir. Str., Clear	—	—	—	1.0	3.0	2.1	5.5	0	0
	23	8.2	10	1	Nim., Cum. Str., Cir Cum.,	—	—	—	5.0	1.0	0	0	0	4.4
	24	7.3	10	0	Cum. Str., Nim.	—	—	—	4.0	5.0	0	5.0	0	0.2
	25	8.1	10	2	Cum. Str., Cir. Str. Veil.	—	—	—	3.0	5.0	0	0	0	0
	26	9.3	10	4	Veil, Cum. Str., Nim.	—	—	—	5.0	5.0	0	0	0	0.3
	27	8.5	10	4	Nim., Cum. Str.	—	—	—	7.0	10.0	0	0	0	1.15
	28	4.0	9.9	0	Cum., Cum. Str., Nim, Cir.	—	—	—	—	8.0	0	2.0	0	1.1
March 1	4.0	—	—		—	—	—	5.0	5.0	0	0	0	0	
Means . .	5.9	9.2	1.7		—	—	—	3.7	5.4	2.1	47.7	0	75.35	

MELBOURNE OBSERVATORY: 1863.

V

AMOUNT OF RAIN	SPONTAN. EVAPORATION		REMARKS.
	Amount.	Temperat. of Water Mean.	
inches.	inches.	°	
0.083	0.310	69.5	Vivid Lightning and dist. thunder (mid. to 4 a. m.) forenoon boisterous and unsettled towards evening wind abating. Fine sunset.
0.000	0.217	68.8	Beautiful, calm and clear morning, afternoon and evening.
0.000	0.217	73.8	Calm clear night. Hot wind (9 a. m.), unsteady, gusty. Dense dry fog. Wind towards S. W. (1 p. m.), Dull, close evening.
0.000	0.210	73.2	Dull night. Windtrees (5 a. m.) solar halo at 3 h. p. m., hazy in the afternoon.
0.140	0.140	71.7	Slight rain throughout the night and early morning. Getting rather boisterous (11 a. m.), Pleasant afternoon. Wind variable. Fine evening.
0.000	0.250	69.3	Steady gentle breeze during the night, 8 h. a. m. breeze getting unsteady E. S. E. to S. at noon between S. and S. W. Fine afternoon but hazy.
0.000	0.250	74.3	Fine, clear night, dew rather heavy. Fine day and evening, at times rather hazy.
0.000	0.330	77.8	Thick smoky atmosphere caused by bush fires (midn.) Gentle gusts of wind (3 h. a. m.), hot wind (8 a. m.) at times very boisterous.
0.000	0.335	75.0	Wind decreasing towards evening. Dense smoke.
0.000	0.300	70.9	Wind freshening (midn.) continuing boisterous until 9 a. m. when the wind shifted to S.S.E. and S.S.W. oscillating all the morning
0.003	0.210	69.7	between these points. Drizzling rain in the evening (10 p. m.)
0.002	0.210	70.5	Dull threatening night. Wind unsteady between S. and S. W. blowing at times very fiercely. Thick haze all round the horizon.
0.491	0.220	72.0	Heavy dew all night until 8 a. m. when it began to get foggy Breeze increasing by 11 h. a. m. and blowing in squalls for the
0.553	0.350	72.8	rest of the day sky mostly overcast.
0.000	0.350	74.7	Smart gusts of wind (2 a. m.) Dull night. Fine morning horizon hazy. Thin veil over the sky. (3 p. m.) Wind unsteady between
0.006	0.230	72.4	S.W. by S. and S. Towards evening boisterous. Calm (11 p. m.)
0.004	0.230	71.6	Calm and heavy dew (midn.) until 5 a. m. Sulky morning, atmosphere very hazy Dry fog (9 a. m.), Scarcely any wind throughout
0.000	0.220	70.8	the day, afternoon hot and close. During the evening Thunder and Lightning.
0.000	0.215	70.0	Raining since yesterday 7 h. p. m. until 11 h. a. m. Wind very light, getting squally by 2 h. p. m. Lightning in the evening threatening sky.
0.004	—	65.7	Dull calm night, wind freshening from N. (3 a. m.) Hot wind (8 a. m.) blowing very fiercely until 1 h. p. m., when it veered to
0.000	—	71.9	S.S.W. decreasing in force. Cloudy all day. Wind W. (10 p. m.)
0.000	—	76.6	Fine pleasant night, morning and afternoon Wind very feeble and variable. Sky very changeable.
0.000	—	76.9	Veil (midn.) calm pleasant night and morning, wind very variable between S.W. by W. to S. by W., 9 h. a. m. fine steady breeze
0.290	—	71.7	from S.S.E. continuing for the rest of the day.
0.257	—	70.6	Hazy night, Veil and fine Windtrees (9 a. m.) Wind oscillating between S. S. W. and S. S. E. Fine morning and afternoon but dull evening.
0.005	—	67.8	Unsteady breeze from W.S.W. gradually drawing towards S. in the course of the day. Sky dull and threatening. Squally in the evening.
0.000	—	69.5	Dark squally night, fresh breeze from S. Drizzling rain at intervals throughout the morning, Dense clouds. In the evening wind decreasing
0.000	—	69.0	Heavy dew all the night. Fine calm weather. Beautiful clear day; very sultry and close (2 p. m.) Strong upper Current toward
0.000	—	69.5	S. (5 h. p. m.), wind S.S.E. In the evening Lightning in E.S.E.
0.000	—	69.8	Strong Northerly gale since 1 h. a. m., lasting only a few hours. Fine day, wind veering towards S. at noon. Clear evening.
1.838	—	71.2	Calm clear night. Very hot day until the wind shifted from N. to S.S.W. Rain (2 h. 50 p. m.) breeze freshening by 1 h. p. m., getting
0.000	0.147	72.7	squally, thunder storm in the evening.
0.000	—	75.4	Distant thunder and Lightning nearly the whole day. Raining throughout and wind very variable, blowing from every point
0.000	0.268	76.9	of the compass. Barometer falling fast (2 p. m.)
0.274	0.380	73.0	Lightning in N. S. S. W. and W. (midn.) Steady smart rain, nearly calm until 9 a. m., when a gale sprang up from N. and blew
0.000	0.190	71.5	throughout the day drawing in the evening towards W. Rain.
0.012	0.192	67.0	Fierce gale from W. with misty rain until 6 a. m. Gloomy morning, the wind drawing towards S., sky clearing. Fine weather
0.000	0.100	—	for the rest of the day, Calm 10 p. m.
0.000	—	—	(Midn.) Clear sky, 1 h. a. m. wind from W.S.W. again, gloomy morning. Fine afternoon with a gentle breeze from South. Evening
0.000	—	—	squally and overcast.
0.000	—	—	Pleasant calm and cloudy night. Sky changeable during the day Wind shifting about S.W. and S. (2 p. m.) Evening calm and overcast
0.000	—	—	Sky very gloomy, calm at times. Clearing 10 a. m. In the afternoon beautiful weather.
0.000	—	—	Dull morning Light southerly winds. Breeze freshening in the afternoon, beautiful clear weather for the rest of the day.
0.000	0.147	72.7	Fine clear night, heavy dew, nearly calm throughout the day. Evening very pleasant.
0.000	—	75.4	Beautiful calm clear moonlight night, Dew (midn. to 4 a. m.) Hot calm day with variable airs.
0.000	0.268	76.9	Calm night. Soon after mid. a breeze sprang up in N.N.E. increasing to a fierce gale from N. and N.N.W. Very dusty, at 6 a. m. a
0.274	0.380	73.0	momentary lull, wind shifting to S. (7 p. m.) dying out.
0.000	0.190	71.5	Lightning and thunder since 10 p. m. last night, scattered drops of rain (4 to 9 a. m.) Thunder and Lightning between 8 and
0.012	0.192	67.0	9 a. m. Very light airs from S. fine clear afternoon and evening.
0.000	0.100	—	Dull calm night. Wind from S.S.W. increasing (1 p. m.) haze and light showers during the day.
0.000	—	—	At times very boisterous during the night. Wind from W., rather cold. Sky frequently changing in the morning. Afternoon
0.000	—	—	fine and clear. Southerly since 10 a. m.
0.000	—	—	Wind again from W. (midn.) Sky overcast (2 a. m.) Dull morning. Wind shifting to S. (9 a. m.) nice little breeze, fine afternoon.
0.000	—	—	Windtrees (6 p. m.) Pleasant evening but dull.
0.000	—	—	Sky very densely cloudy. Wind faint from E. during night, shifting by noon to S.; pleasant evening. Light dew (11 p. m.)
0.000	—	—	In the early morning light breeze from E., clouds drifting towards N.N.E. Fine southerly breeze (10 a. m.) Windtrees (1 p. m.) Fine
0.000	—	—	afternoon. Few drops of rain (11 p. m.)
0.000	—	—	Weather boisterous from S.W. Sky changing. Wind shifting towards S.W. and S. (9 h. a. m.)
0.000	—	—	Squally throughout the whole day.
0.000	—	—	Wind light and very variable, dull gloomy morning day and evening clear.
0.000	—	—	Dew (midn. to 2 a. m.) Sky getting cloudy (3 a. m.) Fine corona Hazy all morning, afternoon and evening very fine and calm.
0.000	—	73.6	Dew (1 to 4 a. m.) calm and light breeze from E. (7 to 11 a. m. calm and variable. Fine breeze from S.S.W. (noon); pleasant afternoon
0.000	0.172	73.6	and evening
0.000	0.152	76.8	Light dew and calm (2 to 6 a. m.) clear day; wind very variable.
0.000	0.180	76.0	Light dew and calm (midn. to 5 a. m.) Perfectly clear day, calms alternating with light winds from S.S.W.
0.034	0.168	73.5	Dew and light northerly winds (4 a. m.); hazy morning; fine southerly wind in the afternoon and evening.
1.007	—	69.5	Dull calm morning. Raining nearly the whole day. Afternoon sultry and calm. Evening squally and threatening.
0.820	—	65.9	Raining the whole day; wind generally light from S. and S.E. with occasional gusts.
0.138	—	63.9	Rain continuing for the day. fresh breeze from S. (1 a. m.) Getting very boisterous in the afternoon and evening.
0.021	—	64.2	Squally, boisterous night with light rain until (10 a. m.) when the wind veered towards W. and W.S.W., having blown from the South.
0.062	—	67.2	Cloudy night. Rain (4 to 8 a. m.) Wind light and variable. Misty rain during the evening.
0.000	—	71.8	Wind light and variable the whole day; cloudy but pleasant. Windtrees (6 p. m.) Dew (10 p. m.)
0.290	—	70.6	Heavy dew and calm until (5 a. m.); Fog (5 to 6 a. m.) Zodiacallight (4 a. m.) Light and variable wind. Windtrees (5 p. m.)
0.009	—	71.9	Dull and calm. Rain (4 to 9 a. m.); Wind very changeable; towards evening breeze increasing from the N. pleasant evening.
0.000	0.096	68.6	Calm and light airs from N. E. dew (2 to 7 a. m.), Dull and sultry day; Breeze S. (9 a. m.) increasing in the evening.
0.002	0.201	65.8	Strong Southerly gusts of wind alternating with calm. Fine pleasant day. Evening cloudy.
0.022	0.175	62.7	Squally unpleasant night; wind for the greater part from W. Fine day light showers (11 and noon) boisterous throughout the evening.
0.050	0.188	63.0	Strong gale from S.W. lasting nearly the whole day, with occasional showers. Lightning (10 p. m.)
0.000	0.122	67.1	Wind gradually decreasing, calm (5 a. m.) raining until this hour; afternoon and evening fine with light dew (10 p. m.)
2.741	—	—	

PERIODS.		TEMPERATURE OF AIR.								PRESSURE OF AIR.										MEAN	
		MEAN.	MEANS OF				Five yearly absolute.		MEAN.	MEANS OF				Five yearly absolute.		DRY.					
			daily.		periodical.					daily.		periodical.									
			Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	MEAN.			Pressure of Vapor	Temp. of Dew-point
Running Number.	DATE.	°	°	°	°	°	°	°	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	°			
1	1st Jan. — 5th Jan.	68.14	80.38	57.33	94.98	52.36	99.9	49.6	29.7890	29.8979	29.6906	30.0062	29.5576	30.078	29.439	29.3786	0.4104	50.52			
2	6th " — 10th "	70.48	82.98	58.93	96.16	53.74	104.6	51.7	29.7724	29.8568	29.7037	29.9524	29.5254	30.093	29.398	3282	4442	55.24			
3	11th " — 15th "	67.84	79.76	57.12	95.84	53.12	111.2	50.0	29.7794	29.8898	29.6896	30.0356	29.5024	30.182	29.378	3706	4088	50.22			
4	16th " — 20th "	65.50	75.61	57.17	93.80	52.22	92.0	47.4	29.8074	29.8936	29.7342	29.9046	29.5858	30.084	29.453	3730	4344	53.96			
5	21st " — 25th "	69.44	80.74	58.33	93.74	52.00	111.0	47.8	29.7224	29.8412	29.6256	29.9826	29.3988	30.232	29.235	2935	4289	53.86			
6	26th " — 30th "	66.08	77.12	56.60	87.16	52.06	99.2	49.8	29.8146	29.8928	29.7460	29.9706	29.5922	30.074	29.437	4122	4024	52.28			
7	31st Jan. — 4th Feb.	67.60	78.91	57.30	91.70	52.08	104.0	50.0	29.8098	29.8870	29.7504	29.9821	29.6308	30.034	29.540	3731	4367	54.08			
8	5th Feb. — 9th "	64.56	74.62	56.32	83.88	51.22	104.0	47.1	29.8402	29.9138	29.7780	29.9834	29.6750	30.117	29.472	4516	3886	51.21			
9	10th " — 14th "	65.88	77.57	55.76	86.52	52.02	94.7	47.5	29.7902	29.8609	29.7245	29.9480	29.5442	30.143	29.170	3148	4212	53.90			
10	15th " — 19th "	64.66	73.41	57.15	81.56	54.38	84.8	48.0	29.7348	29.8180	29.6754	29.9152	29.5694	30.077	29.339	2988	4360	54.17			
11	20th " — 24th "	65.52	75.37	56.83	86.18	52.72	96.7	51.8	29.8175	29.9098	29.7424	30.0090	29.5944	30.164	29.433	4093	4082	52.70			
12	25th " — 1st Mar.	64.94	77.45	56.45	87.04	50.60	93.7	46.1	29.9410	30.0105	29.8754	29.9131	29.7204	30.202	29.550	5345	4065	52.16			
13	2d Mar. — 6th "	66.04	76.70	57.51	83.98	53.01	93.1	48.8	29.8582	29.9305	29.7934	29.9040	29.6718	30.135	29.466	4236	4346	53.30			
14	7th " — 11th "	66.50	77.76	57.28	88.48	51.32	98.6	48.6	29.8782	29.9502	29.8060	29.9600	29.6944	30.170	29.599	4620	4162	52.47			
15	12th " — 16th "	67.76	79.08	58.20	84.42	53.42	96.1	48.9	29.9114	29.9911	29.8424	29.9768	29.6898	30.241	29.550	4988	4126	52.29			
16	17th " — 21st "	63.52	75.09	53.31	82.08	48.56	86.7	46.2	29.8798	29.9557	29.8086	29.9652	29.6540	30.096	29.421	4885	3913	51.82			
17	22d " — 26th "	62.92	72.96	53.84	81.64	47.98	95.2	44.7	29.9422	30.0356	29.8370	29.9540	29.6848	30.237	29.515	5486	3936	52.05			
18	27th " — 31st "	61.68	72.60	51.76	80.92	45.74	85.4	43.0	30.0054	30.0843	29.9305	29.9968	29.8096	30.266	29.700	6380	3674	49.23			
19	1st Apr. — 5th Apr.	63.08	73.06	54.11	82.78	47.46	85.9	43.8	29.9078	29.9808	29.8367	29.9208	29.6590	30.169	29.405	5201	3877	51.27			
20	6th " — 10th "	58.94	67.74	51.50	71.14	46.68	78.0	45.5	29.9436	30.0219	29.8633	29.9124	29.6426	30.225	29.512	5827	3609	49.38			
21	11th " — 15th "	57.88	65.94	50.94	72.64	45.58	79.9	40.8	29.9496	30.0317	29.8708	29.9626	29.5838	30.225	29.375	6060	3436	48.10			
22	16th " — 20th "	56.14	65.23	47.85	72.34	42.58	77.7	39.8	30.0322	30.1091	29.9506	29.9720	29.7250	30.473	29.347	6876	3446	47.64			
23	21st " — 25th "	56.12	65.90	48.14	72.30	42.36	78.4	40.1	30.0422	30.1142	29.9735	29.9434	29.8446	30.408	29.418	7029	3393	47.41			
24	26th " — 30th "	58.58	69.48	50.30	79.24	45.56	94.6	41.9	29.9712	30.0442	29.8937	29.9219	29.6864	30.362	29.497	6178	3534	48.28			
25	1st May — 5th May	55.32	63.05	48.50	67.86	44.68	73.6	41.9	30.0204	30.1002	29.9460	29.9278	29.7124	30.434	29.403	7041	3163	44.76			
26	6th " — 10th "	55.54	63.55	49.24	66.58	43.46	76.2	40.0	30.0690	30.1625	29.9436	29.9123	29.6948	30.364	29.617	7544	3346	44.27			
27	11th " — 15th "	55.70	62.80	49.71	66.52	44.68	69.1	43.8	29.8476	29.9410	29.7578	29.9148	29.5664	30.171	29.416	5220	3256	46.51			
28	16th " — 20th "	52.52	60.20	45.84	64.22	41.12	66.9	36.9	29.7834	29.8680	29.7176	29.9066	29.5692	30.258	29.249	4803	3031	44.82			
29	21st " — 25th "	51.38	58.52	45.20	62.96	41.72	65.8	37.9	29.9244	30.0007	29.8484	29.9107	29.6280	30.321	29.359	6286	2958	43.91			
30	26th " — 30th "	50.54	57.21	45.04	60.86	40.96	64.0	38.8	29.8784	29.9578	29.7968	29.9108	29.6542	30.320	29.453	5816	2968	43.29			
31	31st " — 4th June	49.56	56.76	44.12	59.94	40.06	61.8	35.3	29.9892	30.0590	29.9230	29.9710	29.6890	30.356	29.548	6899	2993	44.67			
32	5th June — 9th "	49.62	56.92	43.42	59.68	38.36	62.7	33.7	30.0112	30.0872	29.9424	29.9298	29.7404	30.406	29.512	7188	2924	45.10			
33	10th " — 14th "	50.88	57.43	45.49	59.90	41.68	64.1	35.0	30.0130	30.0848	29.9393	29.9774	29.7732	30.543	29.667	7127	3003	43.98			
34	15th " — 19th "	47.66	56.16	41.35	58.8	36.08	61.3	33.9	29.9468	30.0282	29.8770	29.9578	29.6488	30.586	29.425	6743	2725	42.41			
35	20th " — 24th "	49.68	56.34	44.17	59.16	39.64	63.1	35.9	29.8868	29.9571	29.8217	29.9588	29.6876	30.293	29.362	5958	2910	43.62			
36	25th " — 29th "	48.32	54.67	43.01	57.36	37.90	59.6	34.6	29.9118	30.0182	29.8231	29.9175	29.5670	30.309	29.377	6384	2734	41.24			
37	30th July — 4th July	47.04	54.52	41.83	57.50	37.94	60.2	32.6	29.9344	30.0108	29.8657	29.9674	29.6474	30.368	29.346	6733	2611	41.49			
38	5th " — 9th "	48.92	55.56	43.12	58.54	39.42	60.7	34.8	29.9372	30.0087	29.8674	29.9102	29.6726	30.277	29.419	6568	2804	42.77			
39	10th " — 14th "	47.64	53.78	42.32	57.74	37.84	62.5	29.0	29.8746	29.9567	29.7952	29.9102	29.6054	30.290	29.425	6030	2716	41.58			
40	15th " — 19th "	47.54	54.32	41.40	57.88	35.18	61.0	31.0	29.9996	30.0750	29.9348	29.9216	29.7012	30.343	29.392	7251	2745	42.03			
41	20th " — 24th "	46.72	53.52	40.56	57.76	34.24	59.7	31.7	29.9570	30.0492	29.8694	29.9178	29.7136	30.364	29.174	6898	2672	41.18			
42	25th " — 29th "	48.10	54.69	42.54	57.02	38.72	60.2	35.3	30.0124	30.0862	29.9458	29.9208	29.8146	30.307	29.470	7408	2716	42.03			
43	30th " — 3d Aug.	46.98	55.05	40.19	58.20	36.32	62.7	31.3													

FLAGSTAFF OBSERVATORY: 1858—1863.

VII

FOR A PERIOD OF FIVE YEAR (1858—1863).

Elevation above the mean level of the sea = 1207 feet.

HYDROMETEORS.										Temperature of Surface Soil.		Radition Mean.		Mean. Amount of Cloud.	WIND.						ATMOSPHERIC ELECTRICITY.				MEAN. Amount of Ozone.		
Running Number.	Relative Humidity.	Mean daily Number of Hours of				Mean daily Amount of		Rain	Evaporation	Mean	Mean daily Rang.	Max. Solar.	Min. Terr.		Mean Direction				Resultant.	Mean Force.	Number of Gales.	Thunder storms Number of days.	Mean pos. Tension.	Mean daily Num. of Registrations.			
		Fog.	Dew.	Hail	Rain	Rain	Tem. of wat.								for the Period.	Number in Quadr.	I.	II.								III.	IV.	Neg.	Zero.
(0-1)						inch.	inch.	°	°	°	°	(0-10)					(0-12)					storms	Light. only.	parts	hrs.	hrs.	(0-10)
1	0.6004	0.0	0.6	0.0	0.6	0.0294	0.2309	70.48	78.00	51.18	113.32	53.28	5.01	S 358 15 E	10 3 1	11 2.71	2.36	2 (S)	2	2	2.69	3.6	2.2	3.45			
2	0.6440	0.6	1.4	0.0	0.9	0.0670	0.2441	72.99	78.94	50.12	114.87	55.04	4.97	3 50	6 7 1	11 1.68	2.03	2 (N)	4	2	2.60	2.2	2.3	3.16			
3	0.6266	0.2	1.0	0.0	1.4	0.0752	0.2613	69.57	74.08	43.08	113.47	55.27	6.56	333 31	7 4 2	12 2.02	2.64	4 (W, N)	2	0	2.31	2.4	1.7	3.83			
4	0.6920	0.1	1.1	0.0	1.3	0.0980	0.2026	70.06	73.02	41.00	105.62	53.03	5.95	342 32	4 4 1	16 3.05	2.00	1 (N)	4	7	2.41	1.5	2.8	3.90			
5	0.6220	0.0	1.0	0.0	1.3	0.0817	0.2521	69.13	74.81	41.52	109.83	55.59	5.73	302 11	6 7 3	9 0.73	2.45	5 (N)	5	5	2.55	3.0	1.6	3.34			
6	0.6452	0.0	1.0	0.0	0.5	0.0558	0.2407	69.95	74.05	44.62	106.96	52.11	5.65	352 21	8 3 2	12 2.69	2.21	4 (W, N)	4	2	2.71	1.7	1.8	2.94			
7	0.6784	0.1	2.1	0.04	2.0	0.1519	0.1694	79.77	76.02	47.04	112.08	54.48	4.62	337 59	5 2 2	16 3.04	2.03	2 (N)	4	4	2.69	1.7	3.3	4.05			
8	0.6448	0.5	0.5	0.0	0.4	0.0147	0.1893	66.20	72.26	41.12	102.10	52.06	6.92	5 50	13 0 1	11 3.76	2.10	1 (N)	0	1	1.96	2.4	4.2	3.41			
9	0.6770	0.0	1.8	0.0	0.5	0.0320	0.1750	70.20	73.28	46.22	110.74	53.28	5.04	8 21	13 2 2	8 2.84	1.76	0	2	4	2.10	2.7	3.9	2.97			
10	0.7182	0.1	1.5	0.0	3.0	0.1083	0.1823	68.89	70.78	35.50	102.44	54.78	6.52	339 1	7 2 3	13 2.52	2.04	2 (NW, SW)	2	2	2.42	1.6	3.9	4.63			
11	0.6684	0.1	1.4	0.0	0.6	0.0286	0.2070	68.22	71.65	41.14	106.90	53.99	5.90	345 14	6 3 1	15 2.92	1.90	3 (N)	2	3	2.84	2.4	2.3	3.95			
12	0.6516	0.3	1.2	0.0	0.9	0.0423	0.1822	68.80	73.02	42.30	107.75	53.67	5.28	5 16	7 6 0	12 2.07	1.85	1 (SW)	1	3	2.19	2.9	3.9	3.90			
13	0.6846	0.2	1.8	0.0	0.6	0.0394	0.1755	70.50	72.76	40.54	111.71	54.91	5.54	314 18	3 3 2	17 3.06	1.61	0	2	1	2.08	1.0	3.7	3.88			
14	0.6494	0.0	1.4	0.0	0.4	0.0037	0.1745	67.75	72.15	39.52	110.58	54.99	6.24	357 43	7 6 2	10 1.62	1.71	1 (N)	1	3	2.09	1.2	3.2	3.13			
15	0.6234	0.1	0.9	0.0	0.2	0.0101	0.1928	67.60	73.49	42.22	109.35	56.03	5.42	326 10	7 8 3	7 0.25	1.94	2 (N)	0	7	1.92	1.2	3.1	3.12			
16	0.6856	0.0	2.0	0.0	2.1	0.1641	0.1183	64.83	68.15	39.62	103.49	48.39	5.22	20 30	8 7 2	8 1.56	1.44	1 (N)	1	2	2.20	1.7	3.1	4.03			
17	0.6990	0.1	2.0	0.0	1.3	0.0176	0.1374	65.33	67.35	35.36	105.49	51.01	5.96	8 1	7 6 2	10 1.69	1.63	1 (N)	3	4	2.45	2.0	2.8	4.09			
18	0.6618	0.0	3.8	0.0	0.3	0.0084	0.1260	64.15	67.14	44.98	108.35	47.95	4.16	348 13	8 3 2	12 2.45	1.44	1 (N)	0	2	2.55	0.8	1.7	3.42			
19	0.6816	0.0	1.6	0.0	1.6	0.1107	0.1109	64.31	66.66	37.26	106.22	51.98	5.90	352 3	6 7 3	9 1.13	1.99	2 (N)	1	5	2.22	2.0	3.3	3.60			
20	0.7332	0.1	2.3	0.0	1.1	0.0334	0.0967	60.77	60.18	27.10	103.31	48.62	6.76	279 14	1 6 5	13 2.07	1.79	0	0	1	2.47	0.8	1.0	5.18			
21	0.7132	0.0	1.2	0.0	1.7	0.0790	0.0809	59.06	59.24	24.86	99.57	47.42	6.92	229 14	5 5 8	7 0.75	2.13	4 (N)	1	3	2.12	0.9	2.2	5.08			
22	0.7606	0.4	2.7	0.01	2.5	0.1540	0.0577	56.69	58.25	26.54	88.87	46.11	5.96	285 52	4 6 5	10 1.14	1.92	5 (N, W)	1	4	2.86	0.6	1.0	4.89			
23	0.7600	0.3	3.7	0.0	1.3	0.0502	0.0612	57.59	58.73	26.75	9.58	42.05	5.54	165 50	6 12 3	4 1.38	1.28	1 (NE)	2	3	3.16	0.3	1.6	4.14			
24	0.7322	0.6	3.9	0.0	0.7	0.0230	0.0713	57.18	60.52	27.78	99.19	46.05	5.20	170 47	2 14 6	3 2.73	1.66	4 (N)	0	4	2.54	0.9	1.8	3.55			
25	0.7248	0.02	1.2	0.0	1.1	0.0404	0.0853	51.44	56.34	22.27	88.31	45.27	6.98	136 24	1 6 13	5 3.03	2.18	1 (W)	0	2	1.85	0.8	1.7	4.05			
26	0.7660	0.2	2.4	0.0	2.2	0.1362	0.0676	54.29	56.20	22.54	86.39	45.26	6.58	192 21	1 11 9	4 2.62	1.74	1 (N)	1	0	3.00	1.1	1.2	4.17			
27	0.7438	0.0	1.3	0.0	1.3	0.0600	0.0645	54.57	55.06	17.84	87.98	48.11	7.12	212 6	1 12 10	2 3.32	2.39	2 (NE, NW)	0	0	2.44	0.6	2.6	3.96			
28	0.7620	0.4	2.8	0.0	1.0	0.0288	0.0690	52.16	52.50	21.09	80.24	42.69	6.24	184 26	0 12 9	4 2.86	2.10	2 (NW)	1	7	3.60	0.8	1.0	3.30			
29	0.7938	0.3	1.8	0.0	1.2	0.0560	0.0785	51.09	51.29	15.75	80.24	41.20	6.62	191 36	0 13 11	1 3.40	2.29	2 (NE, NW)	3	7	2.89	1.2	1.7	5.01			
30	0.8114	0.6	1.7	0.0	2.6	0.0720	0.0614	50.15	50.37	16.71	82.74	41.73	6.96	219 12	2 8 10	5 2.78	2.02	1 (NE)	1	1	2.66	0.7	2.2	5.89			
31	0.8514	0.4	2.8	0.0	2.1	0.0717	0.0346	49.93	49.66	17.76	79.46	41.72	6.92	197 7	2 12 4	7 2.03	1.45	1 (N)	1	1	3.58	0.3	0.4	5.44			
32	0.8328	1.6	3.3	0.01	1.3	0.0599	0.0335	50.04	49.27	17.16	74.07	38.23	6.60	157 1	2 15 3	5 1.86	1.81	1 (NNE)	2	2	3.72	0.6	0.9	4.58			
33	0.8050	1.0	1.9	0.01	1.4	0.0788	0.0560	50.08	50.09	14.72	79.72	44.09	6.82	180 43	1 11 10	3 2.80	2.03	0	0	1	2.78	0.2	1.9	4.94			
34	0.8320	1.8	3.4	0.0	1.4	0.0512	0.0319	47.95	47.46	19.00	77.41	38.38	5.88	165 57	0 16 6	3 3.39	1.46	0	0	0	4.15	0.6	1.3	3.72			
35	0.8184	0.6	2.4	0.0	1.5	0.0407	0.0440	49.12	49.09	15.72	79.50	42.20	6.68	181 51	1 15 7	2 3.46	2.04	0	1	1	3.45	0.8	1.0	5.27			
36	0.8070	0.5	2.5	0.0	2.9	0.1013	0.0516	47.25	47.66	15.48	76.06	39.43	6.58	195 22	1 10 9	5 2.66	2.12	1 (N)	0	1	3.46	0.5	1.2	5.14			
37	0.8028	1.4	2.8	0.0	1.2	0.0666	0.04814																				

Elevation above the mean level of the sea: 120.7 feet.

[illegible]

FLAGSTAFF OBSERVATORY: 1858-63.

IX

5. MONTHLY DIURNAL VARIATION OF MEAN DIRECTION AND RESULTANT OF WIND.

Sense: S. E. N. W. S.

MONTH.	HOUR.	1858.				1859.				1860.				1861.				1862.				1858—63.											
		A.		M.		P.		M.		A.		M.		P.		M.		A.		M.		P.		M.		A.		M.		P.		M.	
		Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.				
MARCH.	mid. noon.	23 56	5.6	343 58	16.8	331 15	13.9	318 24	24.6	243 31	7.4	311 33	12.7	249 20	12.2	287 5	27.4	290 25	8.3	46 1	7.4	290 9	32.50	314 37	82.27								
	1h.	97 59	10.7	333 32	21.5	318 12	14.8	270 23	28.8	213 38	8.1	314 27	19.4	243 25	8.9	309 2	17.4	199 34	5.7	260 12	21.4	244 14	15.02	306 20	99.37								
	2h.	99 47	9.3	346 23	31.9	321 56	15.2	325 54	39.5	197 13	7.6	324 19	30.1	210 59	8.1	346 39	30.7	205 54	8.6	318 23	37.7	230 49	13.38	331 31	166.31								
	3h.	117 37	9.2	347 0	39.8	322 10	10.6	344 9	56.8	170 17	11.7	335 10	30.3	239 5	4.8	345 58	34.9	187 21	8.9	319 38	44.2	179 55	20.29	338 29	202.54								
	4h.	134 56	8.2	352 1	42.6	325 43	15.8	344 17	71.2	197 21	11.3	336 24	33.1	169 0	11.8	344 17	41.3	255 13	13.0	333 16	47.5	222 15	24.93	342 21	234.17								
	5h.	137 55	12.4	1 17	49.3	39 12	12.7	344 7	64.1	175 51	12.5	333 40	30.8	173 28	9.3	348 23	36.5	218 55	14.2	340 34	50.1	163 42	33.37	346 16	228.07								
	6h.	128 39	13.7	6 7	36.0	7 26	8.0	347 36	54.7	190 52	5.5	348 28	26.4	149 22	12.4	0 50	39.6	176 42	12.6	346 23	33.6	136 6	25.59	353 45	188.38								
	7h.	150 5	20.5	11 40	30.2	129 8	1.4	2 35	40.9	54 35	7.3	13 30	23.9	179 9	9.7	359 17	35.2	200 50	13.7	352 40	21.3	168 27	48.72	3 58	150.26								
	8h.	149 44	15.8	25 17	28.1	261 2	10.9	7 23	29.1	159 14	8.6	19 42	15.7	171 22	18.9	4 4	21.8	203 34	20.0	4 7	15.0	184 36	60.60	12 37	108.32								
	9h.	139 40	7.2	38 41	18.2	252 14	12.2	9 22	24.2	203 59	2.1	23 36	13.1	196 35	16.1	348 5	18.2	216 17	23.8	343 16	18.2	210 1	52.99	7 45	86.06								
	10h.	264 9	3.9	32 26	9.6	280 26	22.8	10 12	20.7	283 51	7.4	8 36	4.9	48 8	14.0	356 15	15.0	226 46	21.8	319 16	14.0	264 35	34.16	359 52	58.90								
11h.	141 38	4.0	31 16	7.4	271 44	15.9	351 17	15.9	226 26	8.8	321 56	8.0	183 55	15.0	44 59	3.6	244 49	21.3	317 29	9.0	236 12	29.10	349 22	38.21									
APRIL.	mid. noon.	242 12	9.9	286 16	19.5	213 45	21.1	256 22	27.9	188 49	17.8	215 7	22.7	168 44	14.7	224 30	12.8	251 54	10.3	261 15	23.7	187 41	64.68	251 4	100.01								
	1h.	174 26	3.6	310 23	22.1	204 43	18.7	263 7	27.1	195 28	16.6	225 4	19.3	150 9	19.4	218 28	12.7	289 29	15.2	274 23	26.5	198 42	50.94	272 48	94.24								
	2h.	188 15	10.9	324 11	36.9	192 33	9.5	268 32	19.9	193 5	10.6	244 58	18.6	143 5	19.7	300 54	12.6	287 39	13.3	294 43	23.4	189 19	42.65	292 40	97.99								
	3h.	172 5	17.1	326 14	44.6	203 23	18.6	302 3	20.5	178 18	24.5	253 16	23.6	143 0	24.5	332 5	12.3	259 38	11.4	299 8	31.6	180 34	80.09	304 29	118.99								
	4h.	173 10	16.3	344 43	34.6	194 44	19.6	276 3	27.2	174 0	26.2	256 9	20.7	152 6	23.6	312 16	21.2	202 52	3.4	213 37	34.5	173 41	85.70	305 35	85.26								
	5h.	193 22	12.8	347 31	36.1	189 14	28.2	317 51	16.8	177 47	25.9	234 32	9.0	141 24	25.3	326 26	10.4	240 10	13.9	330 42	25.8	181 44	91.91	330 26	90.72								
	6h.	208 28	17.3	0 34	38.6	183 42	28.4	310 6	1.8	172 56	26.5	202 24	2.5	152 44	25.7	326 48	13.2	242 23	12.9	328 10	34.3	183 42	98.90	340 38	82.21								
	7h.	205 7	15.9	6 0	17.9	203 22	21.8	289 46	11.6	177 5	20.3	184 43	9.9	150 35	22.8	26 27	4.0	232 53	15.2	324 54	26.7	190 21	85.09	327 26	43.70								
	8h.	198 51	22.6	9 25	10.6	180 37	26.0	261 45	15.6	186 2	26.1	192 15	8.2	143 25	27.5	211 33	4.3	209 8	10.0	309 42	22.6	179 22	104.32	288 31	33.20								
	9h.	221 12	17.9	342 39	10.1	210 38	28.7	227 52	17.1	199 26	26.2	128 37	12.1	159 37	17.6	172 17	7.0	206 11	16.4	305 41	26.0	201 5	100.83	267 33	26.41								
	10h.	240 53	13.4	352 39	9.6	220 53	37.4	211 34	17.4	193 14	27.7	163 31	27.1	197 46	17.9	214 8	9.3	231 9	25.8	290 3	18.7	215 38	116.77	218 23	41.56								
11h.	235 57	14.6	323 16	8.7	237 21	35.6	208 5	52.9	213 23	28.9	189 29	23.4	202 54	17.8	218 1	1.6	237 49	25.7	274 45	17.4	227 19	117.85	211 53	33.82									
MAY.	mid. noon.	175 32	23.6	187 47	21.3	172 32	56.2	223 21	55.8	217 20	21.0	230 41	48.0	185 15	28.7	222 13	31.8	174 26	38.8	194 10	47.5	180 53	162.41	214 32	196.21								
	1h.	175 46	28.4	174 4	25.8	190 9	61.2	222 18	70.1	162 46	46.3	236 13	42.3	203 52	36.7	221 30	33.7	174 0	34.1	195 6	51.9	181 47	200.23	213 27	210.73								
	2h.	176 27	29.7	169 58	20.2	189 42	52.3	232 33	77.4	195 21	46.4	238 2	35.6	198 23	33.0	216 35	28.1	174 14	45.8	190 47	49.1	187 2	204.43	216 3	193.64								
	3h.	164 47	38.2	199 12	8.9	191 15	59.0	237 39	66.2	192 43	49.1	265 54	27.3	191 0	39.8	226 18	24.3	176 38	37.2	188 19	31.0	184 48	219.46	229 15	142.68								
	4h.	163 57	29.2	195 15	8.8	185 10	62.6	242 2	56.1	201 30	46.3	230 31	32.1	182 22	65.7	229 10	25.7	176 21	36.3	198 45	28.4	183 40	235.78	226 47	144.29								
	5h.	154 43	34.6	144 2	10.4	182 26	64.4	234 51	58.7	194 43	48.2	222 9	29.6	188 35	46.5	228 21	23.9	185 38	47.1	190 34	29.1	183 21	235.54	214 59	148.18								
	6h.	165 17	33.0	93 27	5.7	187 58	57.0	220 13	50.4	191 9	47.4	216 9	29.2	183 50	41.3	212 11	21.5	170 43	38.5	171 46	24.2	181 40	214.17	206 32	117.15								
	7h.	167 42	28.7	161 40	13.6	190 36	50.2	208 1	44.4	192 35	43.9	219 0	31.7	197 46	42.2	199 13	27.2	177 57	36.7	171 24	34.1	184 8	197.63	196 32	141.87								
	8h.	167 12	36.5	148 19	10.9	195 11	48.0	210 11	49.9	202 22	37.2	207 11	38.6	192 27	44.4	182 20	24.5	182 6	42.1	162 58	40.5	188 23	204.08	189 53	152.02								
	9h.	188 25	26.1	116 31	6.2	190 53	56.4	208 33	38.7	215 12	44.3	206 18	34.6	205 3	38.8	175 34	24.6	181 54	44.1	165 20	39.2	189 9	205.20	187 14	131.27								
	10h.	188 35	36.0	141 6	16.3	213 36	70.2	204 15	47.8	222 58	49.4	211 21	34.5	207 58	42.8	182 20	23.6	187 22	47.7	162 14	42.1	205 54	238.34	185 55	150.16								
11h.	207 11	26.1	137 57	22.1	221 51	68.7	190 38	46.5	239 31	47.2	206 48	38.6	219 48	44.4	195 34	36.7	189 17	39.8	157 59	32.4	217 41	217.01	175 0	162.54									
JUNE.	mid. noon.	176 31	41.0	197 6	35.8	214 28	26.9	220 53	24.4	176 31	23.7	184 13	30.8	170 15	57.1	190 10	59.5	187 37	20.2	223 42	20.5												

5. MONTHLY DIURNAL VARIATION OF MEAN DIRECTION AND RESULTANT OF WIND.

Sense: S. E. N. W. S.

MONTH.	HOUR.	1858.				1859.				1860.				1861.				1862.				1858—63.											
		A.		M.		P.		M.		A.		M.		P.		M.		A.		M.		P.		M.		A.		M.		P.		M.	
		Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.		
JULY.	mid. noon.	182 50	36.9	217 20	40.6	198 58	41.5	223 48	46.1	142 1	22.1	167 48	23.5	185 0	22.1	202 24	19.1	185 28	52.8	205 45	76.0	182 57	168.30	207 46	197.19								
	1h.	165 11	48.1	239 11	42.4	192 47	43.6	163 31	42.3	147 3	23.0	174 10	18.0	184 36	28.5	209 50	18.0	180 38	70.2	206 38	64.4	181 15	208.35	222 3	168.27								
	2h.	187 45	45.2	223 13	37.2	194 12	43.4	236 32	39.7	152 55	23.7	158 43	17.9	182 0	29.8	184 7	18.0	185 38	63.6	203 31	67.0	183 46	201.46	209 14	166.10								
	3h.	206 16	52.2	224 53	29.8	190 21	48.7	239 22	31.8	155 35	25.3	170 55	15.9	184 33	29.9	253 24	31.7	186 15	59.0	196 43	64.9	191 9	210.17	217 22	156.34								
	4h.	189 35	50.0	223 27	33.6	194 45	49.3	222 53	24.5	156 47	21.5	167 35	21.6	184 45	38.2	209 0	25.9	188 22	64.3	197 46	67.1	186 31	219.88	194 26	164.71								
	5h.	199 8	53.3	205 22	28.7	182 23	47.4	238 2	25.4	151 40	22.8	145 39	14.2	186 54	38.7	222 3	17.2	189 29	58.0	190 59	63.6	186 6	214.56	199 48	134.21								
	6h.	200 15	50.7	194 6	28.2	185 38	48.4	211 25	23.4	142 57	21.6	150 25	11.6	182 16	40.3	217 40	14.1	194 9	58.7	185 50	68.9	187 0	211.84	191 55	140.15								
	7h.	205 19	32.6	198 39	33.5	191 55	41.1	199 49	36.8	130 42	15.8	160 40	9.0	174 14	26.5	216 9	16.0	188 42	54.2	189 27	70.9	186 8	162.21	194 41	162.92								
	8h.	192 26	46.8	188 11	43.1	199 29	37.5	192 28	36.2	145 5	28.2	135 47	17.6	184 33	32.6	202 44	22.6	191 18	56.9	182 6	78.5	181 10	193.11	180 59	189.99								
	9h.	190 54	42.9	186 48	46.4	192 36	40.8	192 54	46.6	143 29	22.2	139 37	15.8	192 57	28.3	189 3	26.7	195 28	52.2	181 24	78.8	187 42	179.35	183 21	209.02								
	10h.	203 10	41.5	191 36	61.8	208 5	41.6	194 9	42.9	158 47	19.8	146 26	22.1	198 49	32.2	194 31	24.7	197 36	60.0	181 54	90.4	197 34	189.70	184 51	235.58								
11h.	207 18	38.2	183 5	47.9	215 2	41.1	196 27	45.4	166 18	26.8	145 6	23.0	214 31	30.4	200 23	17.0	213 26	70.6	184 5	78.4	207 6	199.53	183 51	204.78									
AUGUST.	mid. noon.	221 55	52.9	238 5	49.5	186 23	39.0	204 8	47.2	193 44	10.7	289 1	7.9	194 25	15.9	207 53	26.2	228 55	29.9	234 54	29.5	189 5	141.34	224 34	149.98								
	1h.	214 27	47.3	240 48	59.7	180 31	36.3	204 29	50.6	195 5	11.7	276 55	10.4	182 51	15.4	196 20	17.7	222 0	32.9	229 18	28.7	202 43	137.03	225 8	155.37								
	2h.	211 8	56.9	244 13	50.3	195 24	64.1	200 29	40.6	157 41	10.9	299 7	13.8	200 8	16.0	231 44	22.8	207 39	29.3	239 59	18.7	200 48	172.78	234 2	130.42								
	3h.	201 48	56.0	258 59	51.9	188 14	44.3	198 36	37.4	166 23	13.8	302 31	13.9	200 45	20.8	247 8	14.3	214 29	30.5	230 54	10.9	197 31	161.33	242 20	108.53								
	4h.	212 15	50.1	260 38	47.8	183 49	42.7	193 11	28.5	200 10	12.8	335 32	14.4	176 42	15.5	250 18	15.7	219 28	32.8	246 15	27.3	201 24	147.97	248 42	107.62								
	5h.	206 16	53.8	262 32	31.4	177 52	37.9	201 36	35.2	181 22	11.6	304 19	7.8	175 12	25.1	227 35	5.5	222 36	36.5	204 51	13.8	198 50	150.27	231 12	77.49								
	6h.	213 34	25.7	258 47	29.7	187 7	35.8	195 28	31.4	165 45	15.5	150 25	11.6	177 20	16.6	275 11	6.2	231 40	20.5	193 35	19.1	196 35	105.55	213 2	77.78								
	7h.	198 55	43.6	231 59	32.2	201 58	32.8	191 33	30.6	166 43	13.7	160 42	9.0	174 7	15.3	211 9	7.9	228 49	22.7	187 52	20.7	198 36	121.48	202 30	94.44								
	8h.	188 12	35.4	225 28	31.6	192 23	41.6	185 48	30.6	157 35	19.4	140 26	16.4	165 5	16.7	194 29	12.5	216 1	27.7	191 50	25.9	188 0	133.34	192 57	105.35								
	9h.	209 22	40.8	201 57	31.7	204 14	49.5	175 2	32.9	155 28	9.4	131 27	13.7	190 59	20.1	208 4	12.4	229 48	27.3	214 31	22.7	205 47	140.53	189 49	102.39								
	10h.	219 38	48.1	202 9	42.6	207 43	51.8	176 46	36.8	153 6	9.0	148 26	22.1	197 39	24.7	210 47	10.1	223 30	36.9	223 43	21.5	210 37	164.22	190 39	121.45								
11h.	230 52	48.9	217 30	43.9	204 41	53.2	169 29	38.5	207 38	3.9	145 6	23.0	203 35	29.2	191 48	12.7	230 30	37.8	216 2	20.8	216 20	165.65	190 3	122.73									
SEPTEMBER.	mid. noon.	225 14	49.7	256 52	43.0	229 18	14.9	303 22	10.8	175 32	22.6	199 49	39.4	185 18	31.0	196 1	40.3	202 59	28.2	228 12	72.3	204 54	136.82	225 20	181.79								
	1h.	231 1	57.9	262 50	43.3	191 20	8.0	264 2	10.7	175 56	35.8	199 36	33.6	210 27	27.7	202 24	42.5	227 49	27.8	230 34	65.7	212 42	145.62	227 53	177.76								
	2h.	219 23	57.5	258 34	32.6	192 24	11.8	301 29	8.6	171 33	30.2	190 51	27.1	190 28	22.2	241 15	24.9	209 3	24.5	231 28	60.5	201 22	138.68	230 24	147.31								
	3h.	213 2	56.2	278 42	29.2	161 14	10.6	307 19	17.6	181 42	33.8	206 16	23.4	197 55	25.3	228 36	19.6	208 10	27.2	243 41	41.1	199 22	147.28	250 12	111.34								
	4h.	218 5	52.1	264 17	31.4	138 12	14.2	329 18	17.4	174 18	43.5	232 16	15.0	201 59	28.3	229 22	20.7	194 6	32.9	250 37	37.0	193 35	157.40	257 21	105.04								
	5h.	223 13	51.4	253 53	22.7	128 2	6.3	345 51	21.9	174 0	39.6	246 7	9.9	213 56	24.7	186 27	9.1	194 44	30.3	240 46	36.3	200 10	140.33	257 5	70.70								
	6h.	228 44	50.5	309 48	20.4	99 16	11.0	1 38	23.4	161 31	30.8	91 20	3.5	182 33	19.1	221 8	6.8	190 6	35.1	229 35	25.9	191 39	120.47	315 43	34.35								
	7h.	219 42	43.6	253 4	27.9	133 12	9.9	355 36	5.8	168 10	27.2	125 55	10.5	192 58	19.6	188 24	13.1	192 8	39.1	219 18	20.6	162 34	127.35	222 15	50.01								
	8h.	217 50	48.1	218 14	40.0	185 20	5.2	18 26	8.3	167 53	38.3	152 16	16.0	176 58	33.1	161 6	21.6	202 30	47.4	227 7	26.3	192 59	170.56	199 32	80.54								
	9h.	229 24	51.7	239 43	36.9	213 5	10.0	73 33	5.5	172 20	35.6	155 49	23.9	189 22	28.5	149 49	31.0	203 29	53.5	232 56	23.4	203 7	167.84	201 34	66.24								
	10h.	228 30	52.8	224 15	50.3	193 8	7.1	173 0	9.5	194 22	27.4	177 48	25.1	195 59	29.8	175 31	33.4	215 35	46.1	225 29	17.9	211 40	158.15	200 20	124.18								
11h.	240 48	41.2	216 49	59.2	256 53	11.2	199 42	12.6	191 28	43.5	166 8	24.6	189 58	36.9																			

5. MONTHLY DIURNAL VARIATION OF MEAN DIRECTION AND RESULTANT OF WIND.

Sense: S. E. N. W. S.

MONTH.	HOUR.	1858.				1859.				1860.				1861.				1862.				1858—1863.			
		A.		M.		P.		M.		A.		M.		P.		M.		A.		M.		P.		M.	
		Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.	Direc- tion.	Re- sult.
NOVEMBER.	mid. noon.	296 11	5.7	258 2	15.0	303 18	18.2	312 28	29.1	244 26	11.6	321 5	34.3	323 58	5.4	311 58	37.1	260 52	4.8	249 56	37.6	285 56	40.24	294 18	132.80
	1h.	320 24	6.3	311 40	37.5	293 33	13.6	312 42	32.3	151 13	1.3	334 18	47.3	276 5	5.8	315 52	49.2	250 31	6.7	290 53	38.3	285 13	29.00	314 12	198.55
	2h.	247 34	0.8	329 16	47.9	268 10	15.6	308 10	43.6	244 25	17.6	350 11	48.5	222 20	5.6	318 0	39.1	237 8	9.9	259 4	39.3	247 57	47.82	316 13	190.34
	3h.	139 34	5.6	323 33	45.7	272 18	17.7	317 38	44.7	245 22	18.9	352 42	46.0	194 32	6.9	323 9	40.2	189 26	6.6	279 40	27.3	234 10	42.06	323 7	190.15
	4h.	45 42	1.3	3 14	45.0	294 29	15.5	327 14	56.1	232 58	13.5	354 52	51.1	193 50	10.7	342 35	37.8	191 57	16.4	297 40	33.1	227 46	40.46	339 24	207.74
	5h.	170 53	7.8	357 1	45.2	275 32	9.6	338 5	35.1	159 15	12.0	7 31	53.4	249 4	8.2	336 5	36.6	242 15	7.6	289 13	22.6	217 1	30.62	345 30	206.62
	6h.	190 14	9.1	355 22	42.2	269 0	16.4	322 57	46.7	203 51	10.7	3 10	40.5	218 14	9.1	344 17	29.0	209 13	16.3	332 13	38.9	221 35	54.14	343 7	190.28
	7h.	193 36	8.4	357 11	38.9	302 15	12.8	329 16	39.7	236 34	17.1	1 29	25.3	231 24	16.5	322 56	28.3	218 32	22.8	345 54	25.9	234 23	66.65	342 54	152.52
	8h.	254 53	13.2	1 29	45.0	259 39	21.2	326 37	32.5	109 23	13.8	13 30	19.5	265 42	18.0	344 58	23.0	216 55	29.1	344 11	22.9	236 57	66.82	349 48	137.52
	9h.	267 5	20.3	64 9	3.8	268 47	25.9	325 14	30.3	269 41	7.4	12 7	13.0	272 50	11.1	349 45	17.7	222 35	15.4	358 28	21.9	260 42	76.00	349 17	80.11
	10h.	283 39	16.0	312 56	2.0	262 43	22.3	316 24	37.8	265 46	13.3	331 49	12.2	294 12	28.1	313 40	11.6	242 46	30.3	347 39	16.9	268 41	103.41	324 48	78.46
	11h.	135 17	10.1	349 28	11.7	284 31	27.6	311 13	37.0	298 20	21.3	334 3	12.1	306 23	35.7	300 14	10.1	235 55	27.3	328 1	9.5	279 56	91.03	320 41	77.40
DECEMBER.	mid. noon.	288 0	21.9	301 15	26.0	50 7	8.4	258 55	21.8	279 3	15.8	343 19	16.6	220 13	5.1	262 1	28.6	354 43	11.4	333 16	47.1	302 47	40.81	303 3	116.70
	1h.	278 26	11.0	311 13	33.7	79 22	1.6	284 45	26.0	269 23	7.4	328 13	32.9	192 58	8.8	260 31	39.8	343 37	12.6	331 14	46.7	283 37	22.84	304 45	158.83
	2h.	240 17	5.2	323 33	31.4	136 4	3.9	312 37	26.9	268 21	13.6	336 24	39.9	200 55	10.5	272 12	22.4	325 0	10.7	338 1	53.8	255 3	26.21	323 26	162.83
	3h.	217 20	15.2	340 14	46.1	167 16	1.7	331 20	37.0	234 25	14.9	341 37	48.0	193 47	20.3	307 43	19.5	336 52	9.0	338 6	56.8	220 57	44.70	335 25	204.55
	4h.	235 32	19.1	350 53	64.8	196 26	6.3	340 10	43.5	216 9	7.5	341 34	61.1	205 53	14.2	303 57	18.8	333 49	7.8	350 7	70.1	227 43	42.66	343 28	252.85
	5h.	201 13	24.4	346 52	89.1	211 41	6.0	351 19	33.6	234 7	4.2	339 9	54.6	197 37	17.6	311 18	29.6	264 35	5.0	356 31	57.4	208 23	54.04	344 7	257.67
	6h.	244 54	14.7	347 38	17.5	135 14	7.5	349 25	53.5	255 11	9.7	348 4	44.5	203 30	21.7	316 1	33.5	266 9	7.7	0 8	55.8	224 26	48.26	346 52	258.45
	7h.	217 40	24.9	350 1	59.2	204 25	4.9	356 23	41.5	306 49	5.2	354 54	31.9	220 33	22.2	342 11	26.4	247 39	7.6	3 40	32.1	226 23	59.15	353 28	189.93
	8h.	212 35	17.1	358 19	45.8	207 53	15.2	1 20	41.8	230 39	18.1	355 1	26.5	234 4	26.3	326 8	22.4	211 49	16.1	14 20	28.0	221 18	91.07	357 3	159.89
	9h.	231 40	22.9	5 31	33.2	225 33	11.6	17 40	35.2	198 55	20.6	5 10	20.3	249 59	38.7	323 6	11.1	320 21	27.2	357 20	29.0	248 30	93.11	3 32	124.83
	10h.	246 12	18.0	8 3	22.7	233 8	24.0	3 41	23.7	212 19	14.3	331 32	22.2	267 57	30.3	305 3	10.1	268 51	30.5	11 47	20.4	250 46	110.08	353 47	91.91
	11h.	252 29	8.4	292 44	11.6	243 53	21.4	21 35	13.4	250 26	11.4	336 1	20.1	253 1	31.3	288 36	23.2	309 28	44.1	9 10	12.6	271 46	101.98	330 54	63.05
* JANUARY.	mid. noon.	309 43	17.5	262 13	10.4	319 35	19.5	282 20	28.2	317 43	10.9	333 9	38.6	7 51	18.2	301 25	19.7	329 20	12.8	325 27	30.9	339 29	67.34	309 51	116.72
	1h.	279 35	16.6	323 47	29.6	297 55	15.7	309 7	28.0	305 49	12.0	339 33	50.0	338 44	13.2	265 4	27.7	314 8	14.0	328 53	51.6	305 33	67.45	319 34	170.97
	2h.	281 52	12.5	338 37	36.1	308 32	10.6	314 14	38.7	322 30	10.0	333 39	58.9	359 14	9.6	211 25	31.5	302 55	12.7	324 16	48.0	311 7	51.10	326 54	206.63
	3h.	250 4	11.4	350 18	14.2	278 29	19.5	332 0	40.7	348 5	7.3	334 24	55.9	13 14	9.2	343 30	51.8	290 20	12.6	349 11	59.7	295 15	45.55	338 39	221.27
	4h.	218 36	6.7	351 25	37.3	276 18	9.0	359 20	35.6	332 31	8.3	344 20	80.3	32 34	7.4	340 15	59.7	301 50	11.1	348 9	61.5	280 51	21.30	347 12	272.86
	5h.	198 32	9.8	350 45	38.7	247 35	12.1	337 40	39.8	328 17	7.1	350 52	64.3	168 39	4.9	341 1	66.9	288 54	20.1	353 55	63.1	260 27	36.60	347 13	271.26
	6h.	240 47	11.5	346 40	42.2	224 17	10.2	343 25	50.3	4 47	1.6	353 47	57.5	136 37	3.1	351 42	60.7	245 34	2.7	349 15	56.9	299 20	16.88	349 17	266.93
	7h.	218 42	13.9	351 22	36.8	203 21	8.2	349 28	40.0	280 51	12.7	358 23	46.3	162 11	9.8	1 43	46.5	192 8	4.3	352 33	51.5	217 7	36.94	354 56	220.48
	8h.	288 46	13.0	6 7	29.3	312 35	9.2	358 6	35.3	333 0	7.7	14 49	42.0	183 39	6.6	10 28	36.8	232 47	9.2	349 49	47.3	279 32	30.67	3 21	188.05
	9h.	245 32	17.0	356 43	22.2	249 47	25.4	357 23	30.9	247 38	2.1	333 28	30.6	207 47	19.2	1 12	39.9	275 3	6.6	338 35	36.9	235 56	66.44	349 23	157.36
	10h.	232 31	15.3	16 38	21.5	259 8	21.8	348 47	22.0	304 8	9.1	351 18	28.4	217 52	18.2	344 0	32.5	310 42	20.6	333 51	24.0	262 9	71.45	349 53	124.91
	11h.	279 57	11.2	335 20	13.8	280 31	29.8	324 34	30.3	314 7	28.6	345 26	22.4	280 31	16.8	350 12	22.8	310 32	28.7	333 20	18.7	296 5	110.53	337 11	106.41
* FEBRUARY.	mid. noon.	300 55	16.7	265 54	22.2	354 42	24.1	351 55	43.6	345 5	14.2	300 40	19.9	348 33	9.7	351 20	36.9	336							

6. HOURLY VARIATION IN FORCE OF WIND.

Hour.	1859										1860		1860												1861	
	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.		
Midnight	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)		
1 ^h AM	1.33	2.00	2.23	1.74	2.13	2.16	1.28	1.58	1.47	1.42	1.79	1.66	1.22	1.19	1.65	1.45	1.26	0.98	1.73	1.64	1.73	1.79	1.54	1.54		
2	1.39	1.85	2.65	1.57	2.13	2.04	1.23	1.57	1.34	1.13	1.91	1.47	0.97	1.19	2.00	1.61	1.20	1.02	1.98	1.81	1.69	1.59	1.60	1.19		
3	1.39	1.72	2.42	1.79	1.90	2.24	1.37	1.28	1.62	1.21	1.88	1.68	0.86	1.19	2.05	1.51	1.20	0.87	1.77	2.01	2.00	1.69	1.54	1.11		
4	1.44	1.96	2.73	1.71	1.94	2.37	1.47	1.71	1.73	1.35	1.64	1.59	0.96	1.45	2.04	1.42	1.47	1.15	2.00	1.81	1.82	1.78	1.66	1.23		
5	1.68	1.82	2.67	1.77	2.23	2.55	1.45	1.38	1.53	1.26	1.58	1.25	1.23	1.63	2.21	1.49	1.17	1.03	2.22	1.81	1.65	1.78	1.79	1.20		
6	1.77	1.85	2.65	1.86	2.05	2.33	1.64	1.60	1.49	1.42	1.49	1.19	1.34	1.47	2.28	1.60	1.19	0.98	2.10	1.80	1.52	1.60	1.76	1.22		
7	1.67	1.67	2.58	1.73	2.02	2.02	1.63	1.32	1.72	1.62	1.60	1.18	1.14	1.42	2.10	1.44	1.24	0.99	1.80	1.67	1.82	1.65	1.56	1.13		
8	1.78	1.88	2.93	1.86	1.76	1.91	1.68	1.90	1.88	1.86	1.93	1.74	1.15	1.24	1.98	1.40	1.23	1.00	1.76	1.78	1.91	2.03	1.81	1.41		
9	2.02	2.00	2.37	1.71	1.82	2.08	1.65	2.33	2.00	2.30	2.15	1.89	1.39	1.51	1.80	1.43	1.22	1.22	2.20	1.82	2.24	2.36	1.91	1.35		
10	1.93	2.60	2.72	1.51	1.72	2.67	1.93	2.22	2.20	2.50	2.23	2.03	1.49	1.64	2.03	1.55	1.15	1.06	2.38	2.13	2.10	2.24	2.05	1.65		
11	2.13	2.68	3.25	1.71	2.07	2.62	1.94	2.22	2.23	2.65	2.38	2.11	1.34	1.70	2.37	1.73	1.20	1.47	2.62	2.37	2.18	2.17	2.21	1.79		
Noon	2.07	2.72	3.25	1.81	2.23	2.73	2.02	2.28	2.37	2.65	2.57	2.36	1.62	1.70	2.57	2.06	1.34	1.75	2.77	2.25	2.29	2.30	2.47	1.74		
1 ^h PM	2.07	2.75	3.30	1.94	2.43	2.82	2.32	2.28	2.43	2.97	2.68	2.60	1.70	1.69	2.58	1.93	1.37	1.91	2.97	2.29	2.52	2.63	2.61	1.73		
2	2.13	2.50	3.58	2.10	2.47	2.83	2.18	2.37	2.48	3.07	2.55	2.19	1.83	1.82	2.42	1.74	1.42	2.07	2.56	2.35	3.08	2.50	3.11	1.88		
3	2.33	2.60	3.67	1.97	2.47	2.29	2.16	2.55	3.00	2.82	2.90	2.20	2.25	1.80	2.27	1.86	1.37	1.84	2.32	2.35	2.87	2.55	3.08	1.93		
4	2.70	2.40	3.52	1.90	2.50	2.62	2.27	2.67	2.98	2.97	3.18	2.82	2.08	1.97	2.06	1.81	1.42	1.89	2.62	2.34	2.76	2.55	3.05	1.96		
5	3.10	2.28	3.25	1.93	1.97	2.29	2.15	2.34	3.23	3.03	3.25	3.00	2.18	1.88	2.02	1.78	1.32	1.71	2.73	2.57	2.91	2.71	3.39	2.29		
6	2.73	2.00	3.00	1.74	1.97	2.23	2.06	2.00	3.12	2.70	3.12	2.81	2.12	1.60	1.89	1.62	1.06	1.50	2.32	2.48	2.92	2.64	3.19	2.23		
7	2.47	1.87	2.75	1.61	1.77	2.08	2.00	1.83	3.05	2.67	3.12	2.95	1.63	1.26	1.79	1.58	1.07	1.32	1.91	2.28	2.60	2.32	2.82	2.09		
8	1.95	1.67	2.73	1.46	1.72	1.91	1.41	1.50	2.13	2.03	2.73	2.28	1.50	1.42	1.82	1.62	1.10	0.89	1.70	1.89	1.94	1.85	2.02	1.72		
9	1.80	1.90	2.48	1.64	1.57	1.84	1.39	1.33	2.17	2.30	2.56	2.42	1.22	1.36	1.80	1.70	1.22	0.84	1.74	1.98	1.92	1.82	2.13	1.62		
10	1.73	1.67	2.33	1.73	2.06	1.91	1.52	1.26	1.90	2.12	2.34	2.06	1.05	1.47	1.85	1.59	1.21	0.85	1.71	1.94	1.92	1.93	2.14	1.75		
11	1.72	1.85	2.37	1.61	1.93	1.85	1.60	1.31	1.79	1.60	2.20	1.87	1.07	1.31	1.73	1.60	1.35	1.06	1.59	1.82	1.81	1.89	2.07	1.54		
	1.48	1.92	2.32	1.79	2.13	2.03	1.50	1.23	1.71	1.23	1.86	1.96	1.20	1.26	1.80	1.49	1.29	1.00	1.57	1.81	1.72	1.81	1.82	1.49		

Hour.	1861										1862		1862												1863	
	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.		
Midnight	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)	(0-12)		
1 ^h AM	1.44	1.18	1.65	2.30	1.49	1.47	1.85	1.68	1.17	1.64	1.28	1.00	0.98	1.80	1.63	1.30	2.95	1.94	1.85	0.69	1.07	0.98	1.39	1.86		
2	1.39	1.07	1.72	2.32	1.49	1.37	1.82	1.53	1.30	1.29	1.26	0.99	0.83	1.90	1.74	1.35	2.87	2.02	1.85	0.84	1.05	0.97	1.62	1.84		
3	1.28	1.13	1.48	2.47	1.68	1.54	1.38	1.85	1.10	1.40	1.26	1.04	0.95	1.95	2.05	1.30	2.79	1.92	1.77	1.36	0.99	0.94	1.55	1.77		
4	1.32	1.36	1.78	2.32	1.61	1.46	1.57	1.91	1.21	1.55	1.26	1.10	1.29	2.03	1.78	1.27	2.47	1.98	1.67	1.36	0.93	0.85	1.70	1.79		
5	1.31	1.28	1.95	2.25	1.63	1.34	1.67	1.97	1.28	1.45	1.24	1.26	1.61	2.17	1.66	1.30	2.65	2.20	1.96	1.33	1.10	0.84	1.70	1.54		
6	1.48	1.21	1.95	2.20	1.65	1.47	1.70	1.95	1.42	1.47	1.41	1.10	1.21	2.17	2.20	1.45	2.45	2.12	2.10	1.35	1.18	0.78	1.49	1.36		
7	1.31	1.46	1.83	2.17	1.58	1.11	1.67	2.03	1.47	1.69	1.58	1.22	1.05	1.77	2.00	1.48	2.63	2.08	1.87	1.10	1.33	0.86	1.37	1.37		
8	1.62	1.60	1.91	2.12	1.27	0.85	1.45	2.36	1.87	1.83	1.85	1.15	1.18	1.73	1.81	1.49	2.30	1.85	1.95	1.37	1.97	0.98	1.31	1.47		
9	1.85	1.77	2.29	2.12	1.42	0.92	1.97	2.89	2.51	2.25	2.39	1.44	1.44	1.65	1.90	1.34	2.36	1.89	2.67	1.60	2.23	1.55	1.68	1.62		
10	1.54	1.45	1.86	2.18	1.39	1.33	2.32	2.77	2.12	2.84	2.44	1.49	1.69	1.78	2.00	1.55	2.60	1.87	2.52	1.62	2.23	1.60	1.98	1.79		
11	1.66	1.77	2.18	2.27	1.57	1.52	2.70	3.21	2.40	3.06	2.59	1.63	1.67	2.20	2.23	1.62	2.72	2.33	2.98	1.86	2.57	2.00	2.15	1.93		
Noon	1.84	2.07	2.47	2.36	1.53	1.96	2.85	3.24	2.53	3.15	2.68	1.70	1.92	2.42	2.45	1.72	3.41	2.41	3.42	2.23	2.68	2.12	2.16	2.11		
1 ^h PM	2.18	2.04	2.36	2.42	1.87	2.23	2.92	3.29	2.65	3.55	2.69	2.11	2.10	2.52	2.60	1.82	3.63	2.52	3.82	2.36	3.10	2.38	2.36	2.41		
2	1.91	2.14	2.33	2.58	1.93	2.05	3.14	3.19	2.72	3.66	2.89															

7. MEAN MONTHLY MEANS OF FORCE OF WIND FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	During to years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)	(0—12)
S.	1.93	1.76	1.43	1.41	1.12	1.62	1.69	1.95	2.12	2.24	2.44	2.22
S. by E.	1.86	1.65	1.20	1.16	0.80	1.36	1.49	1.61	1.80	1.89	2.03	1.76
S.S.E.	1.48	1.59	1.10	1.03	1.39	1.38	1.31	1.19	1.30	1.50	1.84	1.59
S.E. by S.	1.37	1.26	1.53	1.40	2.37	1.35	1.45	1.62	1.28	1.53	1.66	1.74
S.E.	1.09	1.25	1.10	1.19	1.48	1.34	1.39	1.09	1.32	1.34	1.48	1.88
S.E. by E.	1.02	1.06	1.11	1.31	1.35	1.59	1.50	0.85	1.78	1.53	1.82	2.06
E.S.E.	1.21	1.13	1.08	1.23	1.10	1.09	1.43	0.84	1.39	1.11	1.68	1.43
E. by S.	0.99	1.05	0.98	0.45	0.90	0.72	1.47	0.81	1.75	1.05	1.81	1.53
E.	0.94	0.92	0.87	0.71	1.01	0.78	1.04	0.77	0.86	0.89	1.12	0.79
E. by N.	1.17	1.08	1.36	1.51	0.84	1.64	0.89	1.12	1.04	1.23	1.59	1.20
E.N.E.	0.94	1.15	0.97	1.11	1.15	1.26	1.16	1.14	1.21	1.00	1.21	1.05
N.E. by E.	1.27	1.38	1.53	1.57	1.28	1.32	2.03	1.66	1.49	1.73	1.43	1.41
N.E.	1.44	1.73	1.68	1.44	1.38	1.43	1.74	1.61	1.73	1.49	1.53	1.29
N.E. by N.	1.64	1.96	2.51	2.15	2.02	1.89	2.24	2.22	2.34	2.34	1.96	2.07
N.N.E.	1.85	2.31	2.94	2.33	2.70	2.03	2.71	2.90	2.30	2.28	2.48	2.01
N. by E.	2.32	2.39	3.02	2.78	2.96	2.76	2.81	3.25	3.25	2.88	3.04	2.37
N.	2.56	2.58	2.86	2.51	3.33	2.70	3.04	3.05	3.12	3.57	3.24	2.63
N. by W.	2.03	2.36	2.39	2.32	2.33	2.11	2.28	2.55	2.59	2.96	2.86	2.84
N.N.W.	1.56	1.81	2.29	1.91	2.09	1.62	1.88	2.22	2.14	3.15	2.95	2.53
N.W. by N.	1.78	1.74	2.07	1.68	2.08	1.80	2.09	2.04	2.55	2.14	2.28	1.56
N.W.	1.49	1.22	0.18	1.70	1.85	1.61	1.95	2.22	1.79	2.27	1.84	1.29
N.W. by W.	1.20	1.69	2.03	1.59	2.45	1.88	2.22	2.16	1.71	2.12	1.96	1.64
W.N.W.	1.59	1.88	1.96	1.89	2.07	2.38	2.56	2.04	1.80	2.11	2.18	1.50
W. by N.	2.04	2.06	2.35	1.53	2.42	2.71	2.10	2.41	2.22	2.04	2.33	1.90
W.	2.01	2.27	2.29	2.03	2.59	2.27	2.51	2.62	2.40	2.59	2.83	2.26
W. by S.	2.03	2.18	2.21	2.05	2.40	2.14	2.56	2.47	2.75	2.80	2.86	2.27
W.S.W.	2.25	2.15	1.98	2.13	1.88	2.03	2.58	2.25	2.57	2.65	2.56	2.31
S.W. by W.	1.91	2.33	1.89	1.33	1.89	2.30	2.61	2.48	2.52	2.56	2.50	2.39
S. W.	2.24	1.70	2.08	1.67	1.78	1.90	2.62	2.22	2.70	2.47	2.61	2.46
S.W. by S.	2.12	1.86	1.50	1.53	2.16	2.02	2.01	1.78	2.56	2.75	2.60	2.47
S.S.W.	2.29	2.25	1.32	1.41	1.15	1.77	2.14	1.71	2.69	2.63	2.71	2.49
S. by W.	2.25	2.08	1.70	1.23	1.27	1.35	2.13	1.62	2.42	2.53	2.73	2.62

8. HOURLY VARIATION IN PRESSURE OF AIR.

HOUR.	1859.												1860.												1861.											
	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.												
Midnight	29.915	29.999	29.877	30.035	30.115	29.913	29.960	29.836	29.924	29.833	29.728	29.914	29.857	29.926	29.977	29.929	30.160	30.155	29.911	29.934	29.818	29.814	29.805	29.769												
1h A M	.909	.993	.869	.033	.105	.908	.957	.829	.911	.824	.717	.906	.879	.927	.970	.922	.156	.153	.908	.929	.804	.805	.795	.760												
2	.901	.983	.865	.028	.104	.902	.945	.821	.903	.818	.705	.898	.874	.919	.966	.920	.155	.147	.896	.918	.794	.797	.785	.752												
3	.896	.972	.859	.027	.101	.893	.936	.819	.901	.813	.701	.893	.871	.912	.962	.919	.151	.138	.889	.912	.794	.796	.782	.747												
4	.896	.974	.854	.022	.098	.891	.936	.810	.904	.819	.704	.895	.870	.910	.963	.915	.151	.136	.889	.917	.795	.806	.784	.749												
5	.904	.980	.855	.022	.095	.898	.944	.822	.917	.831	.717	.908	.878	.917	.964	.917	.152	.140	.896	.927	.804	.816	.796	.757												
6	.917	.991	.858	.031	.107	.907	.956	.841	.928	.839	.727	.916	.901	.924	.972	.922	.160	.148	.910	.937	.810	.825	.807	.769												
7	.930	30.002	.868	.043	.123	.921	.964	.854	.939	.849	.737	.925	.919	.949	.982	.928	.173	.160	.926	.953	.829	.833	.817	.780												
8	.938	.012	.874	.054	.134	.930	.971	.854	.947	.851	.740	.931	.929	.948	.996	.935	.180	.172	.929	.956	.830	.841	.821	.788												
9	.945	.015	.881	.065	.144	.935	.972	.859	.949	.847	.738	.934	.925	.953	.30.003	.947	.194	.177	.930	.957	.836	.835	.819	.789												
10	.943	.009	.880	.071	.147	.935	.968	.852	.947	.842	.730	.929	.919	.947	.002	.951	.200	.175	.924	.948	.826	.835	.815	.785												
11	.934	.003	.873	.062	.139	.924	.954	.842	.936	.833	.722	.918	.908	.941	.995	.939	.192	.163	.910	.924	.804	.819	.799	.767												
Noon	.921	29.987	.853	.041	.117	.907	.936	.832	.926	.818	.707	.908	.892	.922	29.995	.939	.192	.163	.910	.924	.804	.819	.790	.758												
1h P M	.908	.969	.830	.021	.098	.888	.918	.824	.913	.802	.695	.892	.875	.905	.965	.897	.168	.144	.895	.924	.793	.810	.783	.757												
2	.894	.957	.830	.011	.092	.878	.906	.807	.902	.777	.685	.879	.863	.897	.956	.885	.139	.108	.865	.903	.779	.790	.775	.735												
3	.886	.953	.829	.010	.090	.871	.934	.795	.892	.777	.674	.868	.855	.895	.955	.886	.141	.103	.859	.896	.779	.795	.761	.738												
4	.879	.951	.835	.014	.097	.873	.898	.799	.892	.771	.665	.865	.852	.894	.961	.892	.143	.099	.861	.899	.779	.788	.779	.748												
5	.890	.957	.847	.022	.104	.882	.906	.807	.896	.772	.664	.864	.855	.899	.968	.899	.149	.106	.871	.904	.793	.815	.779	.748												
6	.907	.974	.863	.033	.112	.894	.919	.817	.911	.786	.678	.878	.865	.911	.981	.908	.160	.115	.888	.914	.809	.815	.796	.766												
7	.914	.985	.876	.038	.120	.905	.932	.832	.944	.823	.715	.908	.899	.933	.996	.922	.172	.126	.899	.927	.816	.821	.799	.779												
8	.929	.993	.883	.045	.125	.914	.944	.852	.944	.837	.729	.916	.909	.938	.998	.924	.183	.140	.917	.930	.826	.828	.815	.789												
9	.931	.998	.894	.048	.128	.916	.949	.856	.951	.840	.730	.916	.912	.937	.999	.923	.184	.141	.919	.932	.821	.830	.812	.789												
10	.934	.996	.898	.051	.128	.912	.950	.845	.953	.840	.730	.916	.912	.937	.999	.923	.184	.141	.919	.932	.821	.830	.812	.789												
11	.926	.988	.839	.049	.126	.906	.944	.840	.953	.838	.736	.916	.908	.930	.994	.923	.185	.139	.916	.932	.813	.825	.808	.784												

9. MONTHLY MEANS OF PRESSURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1859.										1860.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29.930	30.072	30.195	30.155	30.095	29.933	29.981	29.818	30.002	29.841	29.762	29.928
S. by E.	29.914	30.056	—	—	30.123	30.210	29.930	29.955	30.072	29.914	29.850	29.928
S.S.E.	29.964	30.152	—	29.992	30.106	29.948	29.846	29.768	30.018	29.885	29.702	29.916
S.E. by S.	29.991	30.125	30.046	29.956	—	30.085	30.006	29.806	30.026	29.927	29.692	29.946
S. E.	29.986	30.169	30.015	29.963	30.327	30.272	29.959	29.736	29.978	29.922	29.786	29.929
S. E. by E.	29.914	30.158	—	30.113	—	30.076	29.910	29.758	29.951	29.879	29.745	29.978
E. S. E.	29.974	30.120	—	30.251	30.154	30.508	29.885	29.929	29.943	29.832	29.711	29.998
E. by S.	29.923	30.319	—	30.209	30.003	30.236	29.877	29.929	—	29.736	29.709	29.954
E.	29.968	30.053	30.075	30.133	30.014	30.042	29.951	29.921	29.972	29.923	29.689	29.997
E. by N.	29.973	30.025	—	30.280	30.308	30.177	29.948	29.869	30.047	29.777	29.678	29.995
E. N. E.	29.903	30.022	30.028	30.125	29.987	30.112	29.978	29.851	29.997	29.821	29.816	29.853
N. E. by E.	29.950	30.046	29.764	30.231	30.034	30.115	29.930	29.718	29.992	29.739	29.839	29.965
N. E.	29.942	29.994	29.895	30.083	30.050	30.086	29.979	29.839	29.808	29.768	29.725	29.926
N. E. by N.	29.876	29.921	29.782	30.055	30.096	29.973	29.930	29.815	29.704	29.716	29.510	29.908
N. N. E.	29.911	29.879	29.837	29.969	30.016	29.967	29.905	29.766	29.661	29.714	29.691	29.933
N. by E.	29.946	29.878	29.809	29.849	30.041	30.005	29.866	29.748	29.848	29.716	29.641	29.887
N.	29.838	29.843	29.747	30.047	30.061	29.848	29.882	29.760	29.678	29.693	29.614	29.865
N. by W.	29.821	29.840	29.558	29.831	30.022	29.781	30.007	29.845	29.591	29.752	29.647	29.978
N. N. W.	29.824	29.915	29.556	29.962	30.001	29.856	29.967	29.838	29.663	29.826	29.588	30.103
N. W. by N.	29.756	29.873	29.665	29.982	30.137	29.870	29.837	28.815	29.585	—	29.526	30.087
N. W.	29.877	29.981	29.788	29.958	30.139	29.844	29.934	29.838	29.759	29.794	29.606	29.869
N. W. by W.	29.843	30.005	29.850	30.025	30.127	29.840	29.946	30.008	29.584	29.715	29.516	29.611
W. N. W.	29.895	29.962	29.838	29.982	30.141	29.809	29.891	29.886	29.824	29.926	29.585	29.750
W. by N.	29.864	30.003	29.894	30.016	30.098	29.927	29.981	29.857	29.688	29.748	29.609	29.916
W.	29.861	30.033	29.909	29.923	30.087	29.958	29.934	29.842	29.852	29.805	29.659	29.896
W. by S.	29.816	29.989	30.048	30.047	30.126	29.909	29.941	29.914	29.871	29.777	29.638	29.818
W. S. W.	29.812	29.997	30.084	30.064	30.125	29.996	29.948	29.845	29.902	29.806	29.584	29.846
S. W. by W.	29.963	30.008	30.209	30.167	30.138	30.013	29.869	29.885	30.011	29.774	29.728	29.856
S. W.	29.925	29.991	30.170	30.060	30.132	30.060	29.949	29.871	29.941	29.829	29.780	29.893
S. W. by S.	29.907	29.999	30.175	30.129	30.114	29.949	29.929	29.945	30.028	29.865	29.782	29.959
S. S. W.	29.943	29.962	30.208	30.174	30.195	30.051	29.983	29.942	30.011	29.866	29.784	29.928
S. by W.	29.930	30.064	30.213	30.172	30.120	29.939	29.930	29.926	30.016	29.908	29.736	29.925

9. MONTHLY MEANS OF PRESSURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1860										1861	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29.936	29.878	30.260	29.927	30.252	30.259	29.963	29.985	29.879	29.759	29.853	29.848
S. by E.	29.978	29.795	29.996	29.885	30.233	30.199	30.122	29.918	29.846	29.917	29.819	29.807
S.S.E.	29.992	29.816	30.314	29.916	30.077	30.215	30.024	29.988	29.912	29.895	29.837	29.855
S.E. by S.	29.925	29.967	30.312	30.036	29.992	30.207	29.952	29.916	29.833	29.743	29.845	29.801
S.E.	29.972	29.972	29.889	30.084	30.079	30.269	30.133	29.984	29.888	29.963	29.869	29.775
S.E. by E.	29.998	29.998	30.314	30.075	30.190	30.303	30.188	29.974	29.922	29.963	29.869	29.800
E.S.E.	30.042	30.042	—	30.229	30.088	30.287	30.054	30.013	29.883	29.871	29.875	29.795
E. by S.	30.117	30.117	29.975	30.053	30.160	30.318	30.104	30.048	29.878	29.836	29.961	29.676
E.	29.866	30.065	30.040	30.006	30.211	30.259	29.945	30.036	29.824	29.822	29.838	29.814
E. by N.	30.006	30.077	29.983	30.172	30.182	—	30.210	30.020	29.791	29.723	29.737	29.819
E.N.E.	29.935	30.046	30.022	30.071	30.159	30.239	30.097	29.991	29.747	29.679	29.909	29.851
N.E. by E.	29.971	29.970	30.120	30.116	30.148	29.933	29.965	30.113	29.825	29.769	29.820	29.737
N.E.	29.830	29.943	29.989	29.983	30.141	30.142	29.964	29.950	29.770	29.692	29.757	29.775
N.E. by N.	29.883	29.899	29.801	29.826	30.108	30.019	29.973	29.884	29.658	29.740	29.713	29.649
N.N.E.	29.821	29.842	29.868	29.824	30.143	30.255	29.894	29.871	29.787	29.724	29.762	29.625
N. by E.	29.710	29.867	29.825	29.809	30.068	30.067	29.939	29.888	29.794	29.783	29.807	29.700
N.	29.771	29.910	29.876	29.756	30.000	30.024	29.906	29.711	29.720	29.767	29.831	29.762
N. by W.	29.835	29.954	29.827	29.809	30.056	29.862	29.852	29.736	29.700	29.764	29.761	29.541
N.N.W.	29.739	29.915	29.955	29.800	30.054	30.150	29.855	29.753	29.763	29.601	29.555	29.610
N.W. by N.	29.667	29.885	29.806	29.918	30.001	29.733	30.004	29.897	29.832	29.653	29.956	29.578
N. W.	29.856	29.986	30.040	29.783	30.119	30.090	29.828	29.754	29.725	29.719	29.795	29.692
N.W. by W.	29.888	29.998	30.085	29.723	30.020	30.052	29.860	29.710	29.785	29.871	29.732	29.627
W.N.W.	29.740	29.915	30.074	29.911	30.088	30.147	29.888	29.768	29.706	29.686	29.666	29.709
W. by N.	29.625	29.794	30.039	29.886	30.056	29.936	29.899	29.855	29.773	29.641	29.626	29.724
W.	29.837	29.918	30.111	29.915	30.064	30.071	29.892	29.818	29.776	29.776	29.660	29.732
W. by S.	29.825	29.943	30.084	29.925	30.046	30.101	29.876	29.861	29.782	29.782	29.708	29.748
W.S.W.	29.881	29.779	30.144	29.876	30.049	30.185	30.093	29.836	29.798	29.798	29.700	29.775
S.W. by W.	29.814	30.117	30.166	29.966	30.131	30.159	29.884	30.108	29.852	29.852	29.793	29.735
S.W.	29.822	30.111	30.136	30.000	30.207	30.195	29.990	29.668	29.859	29.812	29.804	29.734
S.W. by S.	29.967	30.049	30.077	29.895	30.107	30.143	30.097	29.627	30.056	29.783	29.856	29.857
S.S.W.	29.878	29.947	30.096	29.908	30.217	30.300	30.022	29.918	29.858	29.841	29.865	29.826
S. by W.	29.997	29.950	30.237	29.896	30.145	30.200	29.946	29.943	29.873	29.860	29.845	29.896

9. MONTHLY MEANS OF PRESSURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1861										1862	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29.997	30.172	30.010	30.221	30.064	30.079	30.124	29.932	29.965	29.858	29.829	29.845
S. by E.	29.952	30.116	30.040	30.101	30.146	30.148	29.991	29.970	29.968	29.860	29.878	29.873
S.S.E.	30.028	30.058	30.137	30.163	29.942	30.277	29.904	29.932	29.954	29.919	29.865	29.867
S.E. by S.	30.070	30.128	30.212	—	29.915	30.111	29.870	29.807	29.940	29.826	29.836	29.832
S.E.	30.028	30.113	30.150	30.195	29.830	30.155	30.012	29.929	30.005	29.910	29.845	29.881
S.E. by E.	30.001	30.080	30.203	—	29.948	30.076	29.955	—	29.826	30.039	29.858	29.868
E.S.E.	30.112	30.050	30.188	30.215	—	30.174	29.929	29.708	29.948	29.746	29.829	29.835
E. by S.	29.926	30.048	—	29.839	29.845	30.181	29.930	—	29.898	29.674	—	29.818
E.	29.961	30.067	30.190	30.099	29.836	30.105	30.125	29.804	29.948	29.690	29.856	29.835
E. by N.	29.894	30.063	30.264	29.995	29.840	30.094	29.902	29.864	29.908	29.675	30.209	29.849
E.N.E.	29.980	29.948	30.041	29.944	29.932	30.073	30.012	29.815	29.988	29.714	29.816	29.789
N.E. by E.	29.948	29.924	30.039	29.974	30.043	30.090	29.961	29.766	29.934	29.636	29.832	29.672
N.E.	29.891	29.920	30.059	29.916	29.985	30.044	30.023	29.781	29.875	29.565	29.757	29.739
N.E. by N.	29.927	29.780	29.744	29.837	29.828	29.944	29.804	29.705	29.895	29.533	29.722	29.550
N.N.E.	29.849	29.884	29.916	29.806	29.727	29.922	29.921	29.721	29.926	29.532	29.841	29.633
N. by E.	29.890	29.721	29.941	29.687	29.717	29.941	29.967	29.749	29.890	29.471	29.783	29.698
N.	29.858	29.790	29.823	29.744	29.705	29.959	29.878	29.701	29.882	29.403	29.716	29.639
N. by W.	29.820	29.758	29.885	29.668	29.704	29.854	29.834	29.709	29.865	29.319	29.629	29.578
N.N.W.	29.809	29.769	29.925	29.745	29.677	30.008	29.927	29.710	29.813	29.454	29.730	29.703
N.W. by N.	29.763	29.910	29.950	29.758	29.701	29.814	29.753	29.822	29.665	29.584	29.665	29.647
N.W.	29.820	30.014	29.898	29.836	29.763	29.974	29.759	29.712	29.791	29.566	29.868	29.698
N.W. by W.	30.040	30.113	29.803	29.674	29.671	30.006	30.210	29.799	29.850	29.618	29.583	—
W.N.W.	29.849	29.813	29.866	29.880	29.761	30.095	30.024	29.706	29.805	29.707	29.616	29.680
W. by N.	29.844	29.936	29.945	29.707	29.789	30.022	30.129	29.685	29.764	29.713	29.810	29.852
W.	29.884	29.947	29.856	29.824	29.849	30.015	29.898	29.758	29.782	29.695	29.683	29.797
W. by S.	29.916	30.080	29.897	29.622	29.823	30.008	29.949	29.849	29.872	29.760	29.720	29.767
W.S.W.	29.904	29.967	29.980	29.825	30.077	30.089	29.994	29.846	29.842	29.751	29.681	29.767
S.W. by W.	29.948	—	30.020	—	29.896	30.140	29.896	29.966	29.938	29.833	29.701	29.781
S.W.	29.909	30.019	30.014	29.786	29.976	30.165	30.013	29.903	29.871	29.824	29.810	29.794
S.W. by S.	29.944	30.203	30.088	30.219	30.140	30.128	29.802	29.965	29.845	29.874	29.864	29.874
S.S.W.	29.945	30.107	29.966	30.272	30.082	30.126	29.991	29.941	29.944	29.937	29.826	29.820
S. by W.	29.964	30.196	30.054	30.193	30.053	30.132	30.080	29.861	29.951	29.976	29.806	29.802

9. MONTHLY MEANS OF PRESSURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1862										1863	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29.9227	29.9910	29.9560	30.0554	30.0850	30.0368	29.8780	30.1230	29.9190	29.8490	29.8810	29.8033
S. by E.	29.9610	29.9480	29.9400	30.1898	30.1180	30.0841	30.0188	30.1460	29.9090	29.8680	29.9417	29.8378
S.S.E.	29.9410	29.9047	30.0290	30.1803	30.0470	29.9473	29.9609	30.1801	30.0142	29.7960	29.9648	29.8104
S.E. by S.	30.0020	—	30.0500	30.2514	—	29.9190	30.0130	30.2315	30.0037	29.8480	29.9747	29.8867
S.E.	29.9330	29.9040	30.0530	30.2370	—	30.0890	30.0230	30.1205	29.8510	29.8650	29.9456	29.7727
S.E. by E.	29.9890	30.0045	30.1110	30.1590	—	—	29.8750	30.1250	29.8140	29.9352	29.9346	29.9027
E.S.E.	29.8800	29.9750	30.1170	30.3270	—	30.2990	29.7805	30.0137	29.9670	29.9130	29.9143	29.9776
E. by S.	29.9230	30.1720	30.1340	—	—	30.3520	—	29.9260	29.9380	29.8550	29.6872	29.9730
E.	29.8910	30.0349	30.0770	30.3277	—	30.3070	29.8360	30.0890	29.8270	29.8180	29.7620	29.9286
E. by N.	29.8980	30.1550	30.0440	30.2750	—	30.3330	29.7958	29.9440	29.9915	29.7900	29.6400	29.8876
E.N.E.	29.8670	30.0105	29.9010	30.25.9	30.0665	30.0650	29.8450	30.0747	29.8810	29.7960	29.8110	29.8831
N.E. by E.	29.9160	30.0066	29.9780	30.1827	30.1500	29.8560	29.7600	29.9230	30.0530	29.7413	29.8535	29.8015
N.E.	30.0550	30.0226	29.9080	30.0167	29.9640	30.0145	29.7648	30.0250	29.7660	29.7510	29.8033	29.7421
N.E. by N.	29.8820	29.9676	29.7430	30.0105	29.9410	30.0397	29.8440	29.9745	29.8160	29.6910	29.7760	29.8162
N.N.E.	29.8890	29.9487	29.8070	30.0350	29.8240	30.0790	29.8480	29.8987	29.8130	29.75.0	29.7216	29.7708
N. by E.	29.7330	29.8790	29.8110	30.0607	29.7870	30.0098	29.7550	29.8170	29.7880	29.6460	29.6871	29.6516
N.	29.7480	29.9068	29.7860	29.9980	29.7390	29.9320	29.7720	29.8830	29.7360	29.6207	29.6365	29.7351
N. by W.	29.9030	29.7962	29.8400	29.8280	29.7380	29.8941	29.6828	29.8330	29.8017	29.7462	29.5764	29.6250
N.N.W.	29.8170	29.9990	29.8060	29.8010	29.7560	30.0039	29.7890	30.0438	29.7700	29.7202	29.6750	29.7176
N.W. by N.	29.9170	29.5970	29.9070	29.7540	29.7550	29.9840	29.7684	30.0715	29.6290	29.5645	29.7280	30.0790
N.W.	29.8430	29.9344	29.8920	29.9353	29.7180	29.9210	29.7030	29.9980	29.7880	29.8094	29.7332	29.7451
N.W. by W.	29.8390	29.8168	29.8080	29.9065	29.7940	29.7173	29.6603	29.6900	29.8210	29.8390	29.7626	29.6290
W.N.W.	29.8110	29.9108	29.8800	29.8481	29.8100	30.0432	29.6323	30.0970	29.7815	29.8037	29.7477	30.0133
W. by N.	29.8230	29.8180	29.9130	29.8880	29.8960	30.0406	29.7818	29.9104	29.7750	29.7340	29.8736	29.8447
W.	29.8630	29.8517	29.8510	29.8933	29.7640	30.0612	29.6670	29.9570	29.8527	29.7420	29.7447	29.8644
W. by S.	29.8940	29.9680	29.8420	30.0314	29.9120	30.1168	29.7910	29.9120	29.9010	29.7540	29.7909	29.8380
W.S.W.	29.8550	29.9862	29.5160	29.9180	29.9650	30.0263	29.7340	30.0220	29.8130	29.6940	29.8240	29.8677
S.W. by W.	30.0050	29.9270	30.0630	30.2416	29.9310	29.9467	29.8410	30.1168	29.8460	29.7890	29.8470	29.8324
S.W.	29.8970	30.0003	29.8820	30.1762	29.9710	30.1042	29.7940	29.9970	29.8170	29.8109	29.7806	29.8390
S.W. by S.	29.9050	29.9380	29.9330	30.3090	29.8290	29.9825	29.8413	30.0280	29.9300	29.8705	29.8305	29.9388
S.S.W.	29.9000	29.9773	29.9800	30.0934	30.0250	29.9831	29.9330	30.1220	29.9279	29.7140	29.8799	29.8110
S. by W.	29.9050	30.0240	30.0830	30.1000	30.0810	29.9108	29.8990	30.1080	29.9080	29.8070	29.8527	29.8234

NB. In this table are the values of Pressure of air for October to February not yet corrected for change in elevation, 0.029 ought therefore to be subtracted to make them comparable with the preceding values.

9. MEAN MONTHLY MEANS OF PRESSURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	29.9450	30.0417	30.0409	30.1620	30.1090	29.9993	29.9566	29.9530	30.0550	29.8078	29.8426	29.8446
S. by E.	29.9366	30.0213	29.9964	30.0483	30.1554	30.0880	29.9645	30.0010	29.9250	29.8524	29.8610	29.8400
S.S.E.	29.9797	30.0260	30.0203	30.0430	30.0238	30.0670	29.9212	30.0214	29.9500	29.9320	29.8580	29.8620
S.E. by S.	30.0030	30.1026	30.0020	30.1009	30.0095	30.1010	29.9788	29.9860	29.9050	29.9790	29.8560	29.8690
S.E.	29.9816	30.0450	29.9971	30.1584	30.0281	30.1973	29.9752	29.9981	29.9286	29.8814	29.7990	29.8590
S.E. by E.	29.9730	30.0794	30.0270	30.1349	30.1099	30.2206	29.9890	30.0293	29.9070	29.8770	29.8343	29.8901
E.S.E.	29.9898	30.0550	30.0334	30.2235	30.1015	30.2717	29.9418	29.9820	29.9372	29.8297	29.8042	29.8760
E. by S.	29.9442	30.0443	30.0035	30.0910	30.0535	30.2880	29.8950	29.9510	29.8771	29.7777	29.7790	29.7930
E.	29.9226	30.0813	30.0681	30.0920	30.1191	30.0712	29.9460	29.9620	29.8629	29.7754	29.7740	29.8930
E. by N.	30.0562	30.1002	30.0427	30.1452	30.0928	30.0437	29.4330	29.9320	29.8410	29.6842	29.7160	29.8680
E.N.E.	29.9170	30.0151	30.0014	30.1192	30.0459	30.0659	29.9848	29.9146	29.8980	29.7360	29.8400	29.8160
N.E. by E.	29.9542	29.9910	29.9762	30.1456	30.0860	29.9931	29.8870	29.9064	29.9628	29.7569	29.8186	29.8220
N.E.	29.9289	29.9873	30.0423	30.0149	30.0530	30.0424	29.9392	29.9009	29.8068	29.6781	29.7580	29.8040
N.E. by N.	29.8945	29.9074	29.8110	29.9394	29.9935	29.9238	29.8977	29.8657	29.7887	29.6953	29.7230	29.7729
N.N.E.	29.8625	29.9049	29.8587	29.9170	29.9160	30.0150	29.8604	29.7991	29.7901	29.6675	29.7570	29.7557
N. by E.	29.8708	29.8652	29.8401	29.9808	30.0208	29.9106	29.8519	29.8125	29.7850	29.6543	29.6950	29.6990
N.	29.8488	29.8930	29.8095	29.8921	29.8891	29.8820	29.8262	29.7669	29.7360	29.6170	29.6720	29.7567
N. by W.	29.8475	29.8590	29.7907	29.8140	29.8847	29.8205	29.8190	29.8018	29.7361	29.6172	29.6710	29.6620
N.N.W.	29.8348	29.8988	29.7688	29.8450	29.8280	29.9600	29.8356	29.8240	29.7449	29.6021	29.6210	29.7030
N.W. by N.	29.8792	29.8909	29.8010	29.8850	29.9058	29.8040	29.7455	29.8660	29.7240	29.6872	29.7170	29.7230
N.W.	29.8755	29.9739	29.9253	29.8987	29.9178	29.8860	29.7595	29.8240	29.7618	29.7048	29.7200	29.7340
N.W. by W.	29.9145	29.9750	29.9290	29.8230	29.8926	29.9103	29.7450	29.8207	29.7910	29.7888	29.6530	29.6730
W.N.W.	29.8237	29.9140	29.9477	29.9410	29.9165	29.9360	29.7660	29.8400	29.7870	29.7450	29.6550	29.7660
W. by N.	29.8313	29.8920	29.9490	29.9310	29.9580	29.9030	30.0937	29.8486	29.7492	29.7037	29.6950	29.7860
W.	29.8629	29.9260	29.9634	29.9154	29.9361	30.0640	29.8224	29.8500	29.8095	29.7463	29.6872	29.8010
W. by S.	29.8733	29.9732	29.9920	29.9967	29.9859	29.9540	29.8664	29.8710	29.8249	29.7090	29.7000	29.7820
W.S.W.	29.8640	29.9565	30.0312	30.0034	30.0684	30.0204	29.8531	29.8970	29.8270	29.7101	29.7041	29.8010
S.W. by W.	29.9042	29.9788	30.0735	30.1138	30.0701	29.9770	29.8063	29.9930	29.8450	29.7600	29.7730	29.8030
S.W.	29.8825	30.0104	30.0364	30.0727	30.0605	30.0340	29.8814	29.8520	29.8585	29.8019	29.7439	29.8177
S.W. by S.	29.9301	30.0179	30.0807	30.1180	30.0159	30.0200	29.8542	29.9969	29.9392	29.8290	29.8200	29.8820
S.S.W.	29.8941	30.0003	30.0422	30.0921	30.1360	30.0912	29.9731	30.0150	29.9278	29.8130	29.8440	29.8268
S. by W.	29.7617	30.0583	30.0506	30.1150	30.0936	30.0450	29.9577	29.9870	29.9260	29.8390	29.8310	29.8302

Note: In this table the correction for change of elevation of the Barometer during the period from October 1862 to February 1863 has been applied.

10. LUNAR VARIATION OF THE BAROMETER.

MONTHS.	YEARS.	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h	24h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
		inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
March.	1858	0.9966	1.0028	0.9990	1.0040	0.9975	0.9922	0.9960	0.9992	1.0040	1.0090	1.0020	0.9908	0.9940	0.9992	0.9996	1.0043	0.9995	1.0020	1.0175	1.0219	1.0092	0.9997	0.9935	0.9912
	1859	0.9970	0.9993	1.0089	1.0036	0.9942	0.9900	0.9902	0.9846	0.9880	0.9877	0.9884	0.9912	0.9904	0.9968	1.0001	0.9999	1.0043	1.0062	0.9952	1.0071	1.0072	1.0070	0.9959	1.0043
	1860	0.9920	0.9972	0.9981	0.9871	0.9916	1.0028	0.9978	0.9854	0.9872	0.9839	0.9805	0.9858	0.9873	0.9816	0.9828	0.9835	0.9858	0.9809	0.9896	0.9983	1.0025	1.0037	0.9928	0.9907
	1861	0.9965	0.9969	0.9962	0.9988	0.9950	0.9994	1.0025	0.9982	0.9986	1.0083	1.0026	0.9947	0.9958	0.9950	0.9944	1.0025	1.0052	1.0061	1.0139	1.0114	1.0077	1.0008	0.9972	0.9945
	1862	0.9960	0.9940	0.9915	0.9940	0.9948	1.0020	1.0036	1.0054	0.9970	1.0019	1.0052	1.0075	1.0018	0.9953	0.9980	1.0004	1.0001	1.0020	0.9990	0.9990	1.0050	1.0046	1.0046	
April.	1858	0.9959	0.9937	0.9848	0.9911	0.9926	0.9889	0.9928	1.0035	1.0024	1.0078	1.0060	1.0166	1.0164	1.0079	1.0055	1.0044	1.0011	0.9993	1.0088	1.0084	1.0065	0.9940	0.9989	0.9904
	1859	1.0100	1.0085	1.0149	1.0146	1.0135	1.0144	1.0195	1.0135	1.0023	0.9908	0.9868	0.9847	0.9911	0.9964	0.9967	0.9838	0.9883	0.9875	0.9886	0.9960	0.9929	0.9934	1.0039	1.0135
	1860	0.9943	0.9944	0.9860	0.9853	0.9847	0.9894	0.9982	1.0006	0.9997	1.0056	1.0085	1.0159	1.0103	1.0023	1.0034	1.0052	1.0171	1.0197	1.0058	0.9987	0.9929	0.9929	0.9906	0.9961
	1861	1.0108	1.0124	1.0135	1.0170	1.0142	1.0250	1.0032	0.9844	0.9849	0.9883	0.9885	0.9967	0.9938	0.9756	0.9771	0.9881	0.9970	1.0067	1.0062	1.0095	1.0141	1.0186	1.0091	1.0047
	1862	0.9994	0.9986	1.0100	1.0058	1.0020	0.9972	0.9934	0.9962	0.9960	0.9950	0.9903	0.9949	1.0012	1.0056	1.0121	1.0076	0.9979	0.9956	0.9944	0.9959	1.0035	0.9988	1.0036	0.9994
May.	1858	1.0198	1.0068	1.0108	1.0111	1.0073	1.0024	0.9943	0.9816	0.9801	0.9795	0.9920	0.9872	0.9910	0.9976	0.9921	0.9975	1.0013	1.0025	1.0072	0.9995	1.0053	1.0083	1.0135	1.0196
	1859	0.9807	0.9825	0.9836	0.9799	0.9835	0.9832	0.9891	1.0023	1.0122	1.0073	1.0186	1.0627	1.0248	1.0553	1.0239	1.0272	1.0098	0.9981	1.0008	1.0152	1.0024	1.0082	1.0143	0.9918
	1860	1.0310	1.0346	1.0265	1.0219	1.0182	1.0119	1.0110	1.0049	1.0016	0.9964	1.0007	0.9984	0.9904	0.9881	0.9930	0.9985	1.0086	1.0066	1.0105	1.0070	1.0179	1.0263	1.0296	1.0219
	1861	0.9934	1.0047	1.0077	0.9959	0.9781	0.9955	0.9982	1.0052	1.0041	1.0008	1.0032	1.0153	1.0153	1.0093	1.0091	1.0103	1.0044	1.0004	1.0073	0.9957	0.9773	0.9771	0.9863	0.9882
	1862	0.9903	1.0061	1.0038	1.0081	1.0133	1.0073	1.0021	1.0088	0.9968	0.9945	0.9972	1.0002	0.9996	1.0002	0.9930	0.9950	0.9902	0.9982	1.0020	1.0010	0.9951	0.9964	1.0007	1.0002
June.	1858	0.9872	0.9862	0.9878	0.9894	1.0029	0.9981	1.0000	1.0172	1.0140	1.0044	1.0062	1.0094	1.0121	1.0156	1.0133	1.0070	1.0033	0.9882	0.9839	0.9860	0.9895	0.9952	0.9956	0.9914
	1859	0.9913	0.9897	0.9866	0.9869	0.9885	0.9930	1.0081	1.0005	0.9908	0.9847	0.9953	0.9920	0.9875	0.9821	0.9780	0.9771	0.9771	0.9753	0.9755	0.9724	0.9808	0.9956	0.9865	0.9926
	1860	0.9766	0.9774	1.0177	0.9780	0.9890	0.9822	0.9730	0.9676	0.9625	0.9671	0.9704	0.9745	0.9805	0.9802	0.9790	0.9801	0.9790	0.9740	0.9800	0.9646	0.9618	0.9683	0.9742	0.9809
	1861	1.0013	0.9904	0.9889	0.9945	1.0016	0.9909	1.0020	1.0006	1.0123	1.0135	1.0087	1.0097	1.0131	1.0110	1.0116	0.9990	1.0002	0.9837	0.9934	0.9953	0.9927	0.9832	0.9825	0.9897
	1862	1.0130	1.0300	1.0207	1.0082	0.9930	0.9933	0.9904	0.9851	0.9912	0.9997	1.0186	1.0192	0.9947	0.9821	0.9781	0.9846	0.9814	1.0010	1.0002	1.0037	1.0030	1.0015	1.0166	1.0192
July.	1858	1.0033	1.0156	1.0165	1.0229	1.0151	0.9986	0.9990	0.9979	1.0012	0.9992	1.0110	0.9991	0.9993	0.9850	0.9829	0.9822	0.9886	0.9929	1.0004	1.0038	1.0054	1.0034	1.0021	1.0036
	1859	0.9754	0.9635	0.9581	0.9596	0.9567	0.9699	0.9647	0.9677	0.9660	0.9768	0.9792	0.9793	0.9740	0.9760	0.9700	0.9724	0.9730	0.9744	0.9774	0.9793	0.9842	0.9858	0.9767	
	1860	0.9452	0.9372	0.9435	0.9490	0.9515	0.9549	0.9570	0.9519	0.9500	0.9498	0.9485	0.9452	0.9485	0.9519	0.9422	0.9427	0.9470	0.9552	0.9453	0.9390	0.9432	0.9494	0.9538	0.9519
	1861	0.9978	0.9957	1.0037	1.0010	1.0083	1.0040	0.9976	0.9867	1.0010	0.9870	0.9924	1.0017	1.0014	0.9942	0.9955	0.9986	0.9977	0.9990	1.0072	1.0116	1.0145	1.0107	1.0098	1.0006
	1862	0.9970	0.9921	0.9938	0.9950	0.9916	0.9927	0.9959	1.0031	0.9883	1.0030	1.0160	1.0112	1.0100	1.0012	0.9983	0.9993	0.9960	0.9938	0.9968	0.9990	1.0060	1.0105	1.0070	0.9888
August.	1858	1.0092	1.0127	1.0015	0.9946	0.9893	0.9901	0.9910	1.0046	1.0070	1.0049	0.9975	0.9895	1.0354	0.9893	0.9930	1.0023	1.0060	1.0128	1.0068	1.0030	1.0015	1.0060	1.0064	1.0009
	1859	1.0543	1.0442	1.0595	1.0600	1.0639	1.0632	1.0632	1.0705	1.0754	1.0802	1.0663	1.0745	1.0759	1.0740	1.0639	1.0725	1.0739	1.0724	1.0689	1.0548	1.0504	1.0503	1.0514	1.0590
	1860	1.0337	1.0331	1.0349	1.0420	1.0449	1.0474	1.0459	1.0390	1.0358	1.0273	1.0252	1.0272	1.0241	1.0394	1.0231	1.0279	1.0340	1.0333	1.0314	1.0330	1.0281	1.0385	1.0374	1.0355
	1861	0.9920	0.9904	0.9974	1.0064	1.0005	0.9967	0.9910	0.9926	0.9972	0.9967	0.9989	1.0054	1.0012	1.0181	1.0107	0.9947	1.0006	1.0026	1.0037	1.0132	1.0039	0.9908	0.9942	0.9949
	1862	1.0005	1.0010	0.9962	0.9974	0.9945	0.9945	0.9900	0.9997	1.0100	1.0100	1.0089	1.0051	0.9990	1.0010	0.9991	0.9977	0.9967	0.9965	0.9960	0.9977	1.0090	0.9970	0.9920	0.9958
September.	1858	0.9953	0.9917	1.0020	0.9948	1.0091	1.0142	1.0041	0.9900	0.9947	1.0004	0.9990	1.0160	1.0138	0.9986	0.9916	0.9942	0.9956	1.0101	0.9968	0.9994	0.9898	0.9890	1.0009	0.9992
	1859	1.0131	1.0189	1.0066	1.0021	0.9951	0.9948	0.9977	0.9987	0.9943	0.9962	0.9945	1.0040	0.9954	0.9991	0.9960	0.9954	0.9954	0.9903	0.9821	0.9914	1.0051	1.0021	1.0036	1.0029
	1860	1.0481	1.0379	1.0328	1.0292	1.0249	1.0180	1.0128	1.0067	1.0110	1.0206	1.0135	1.0240	1.0379	1.0492	1.0505	1.0516	1.0546	1.0610	1.0595	1.0537	1.0360	1.0316	1.0359	1.0354
	1861	0.9950	1.0033	1.0045	1.0040	1.0177	1.0192	1.0122	1.0029	1.0104	1.0073	1.0172	1.0084	1.0058	1.0000	0.9996	0.9940	0.9894	0.9891	0.9902	0.9863	0.9946	0.9845	0.9814	0.9856
	1862	0.9857	0.98																						

11. HOURLY VARIATION IN TEMPERATURE OF AIR.

HOUR	1859										1860		1860										1861	
	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
Midnight	56.98	54.30	50.69	45.91	44.61	49.20	48.68	52.75	54.76	60.31	61.82	59.31	60.74	55.19	52.47	47.15	43.85	46.45	49.64	52.57	55.41	59.30	62.19	60.25
1h AM	56.22	53.55	50.51	45.65	44.01	49.09	48.20	51.90	54.36	59.52	61.04	58.99	60.14	54.63	51.97	46.72	43.40	46.02	48.98	51.68	54.95	58.38	61.70	59.46
2	55.95	53.15	50.15	45.51	43.53	48.90	47.67	51.28	54.11	58.98	60.26	58.29	59.41	54.15	51.50	46.16	43.16	45.61	48.52	51.59	54.23	57.62	61.26	58.87
3	55.45	52.77	49.78	45.31	42.82	48.66	47.15	50.87	53.69	58.36	59.59	57.67	58.86	53.83	51.07	45.69	42.76	45.14	47.97	51.31	53.78	57.39	60.72	58.40
4	54.50	52.40	49.56	45.04	42.81	48.30	47.00	50.73	53.42	57.95	58.87	57.11	57.81	53.59	50.65	45.57	42.24	44.77	47.51	51.09	53.58	57.12	60.05	58.30
5	54.20	52.07	49.58	45.02	42.61	48.21	47.09	50.67	53.50	58.30	58.96	56.71	57.80	53.29	50.58	45.11	41.89	44.44	47.06	50.96	54.08	57.34	59.91	57.88
6	53.85	51.85	49.22	45.15	42.52	47.87	46.74	51.62	55.58	60.78	61.01	57.47	57.35	52.87	50.50	44.88	41.68	44.27	46.74	51.72	55.95	59.27	61.14	58.08
7	55.83	52.48	49.27	45.00	42.48	48.07	48.62	54.63	59.27	65.08	64.50	59.61	59.55	53.67	50.66	44.93	41.43	44.62	49.12	55.03	58.47	62.62	63.51	60.74
8	58.98	55.28	50.61	45.70	43.43	49.63	51.88	58.17	61.73	68.95	68.12	64.17	62.61	56.10	52.24	46.16	42.56	46.70	52.28	57.16	61.35	66.43	66.76	63.58
9	62.80	59.20	53.17	47.67	45.83	52.26	55.45	60.55	63.77	72.20	71.03	67.67	66.61	58.99	54.83	48.29	44.97	49.89	55.55	59.72	63.06	67.91	69.56	67.13
10	65.97	62.68	55.52	49.89	48.83	54.31	58.40	63.40	66.04	74.93	74.61	71.05	70.11	61.85	57.54	51.05	48.50	52.95	58.15	61.79	65.61	70.08	72.16	69.48
11	67.15	64.52	57.24	51.99	51.29	55.61	59.82	64.75	67.38	76.19	76.72	73.17	71.69	64.35	59.29	53.42	50.83	55.59	60.48	63.65	67.30	71.78	73.94	71.28
Noon	69.10	65.08	58.22	53.54	52.62	56.78	60.94	65.57	68.60	78.12	78.09	73.94	72.99	65.32	60.32	55.16	52.58	56.92	61.31	64.38	68.86	72.62	74.70	72.62
1h PM	70.53	66.23	59.01	53.92	53.00	57.64	61.57	66.30	69.51	78.31	78.34	75.71	74.49	65.98	60.61	56.03	53.49	57.85	62.08	64.11	69.06	72.50	74.36	73.82
2	72.35	66.03	59.13	54.38	53.37	57.98	61.99	66.65	69.14	78.72	78.54	75.01	74.41	65.71	60.71	56.17	54.10	58.17	61.86	63.24	68.91	72.29	74.81	73.55
3	69.05	65.82	58.24	53.85	52.84	57.25	61.75	66.33	68.59	77.89	78.40	74.37	74.47	65.58	60.04	55.70	53.77	57.44	61.54	63.25	67.80	71.39	74.80	72.98
4	67.97	64.83	56.91	52.42	51.51	56.03	60.73	64.78	66.79	77.12	77.00	73.20	74.09	64.88	58.80	54.16	52.25	56.04	60.04	61.87	65.82	70.25	73.58	71.71
5	66.67	62.70	54.67	50.69	49.38	54.25	58.90	62.85	65.36	75.82	74.86	71.63	71.71	62.46	56.70	52.35	50.00	53.79	57.81	60.32	64.71	69.34	72.43	69.88
6	63.65	60.47	53.35	49.94	48.23	52.56	56.01	59.87	63.57	71.95	72.52	69.05	69.55	60.39	55.52	51.55	47.17	51.64	55.38	58.28	62.71	67.72	70.45	67.48
7	61.90	59.22	52.47	49.19	47.42	51.64	54.51	58.00	60.50	68.81	69.40	66.03	66.95	59.50	54.90	50.73	47.67	50.48	54.03	56.65	60.03	65.21	67.60	65.33
8	60.33	57.82	51.88	48.49	46.70	50.68	53.56	56.48	59.24	65.27	66.92	64.25	65.12	58.35	54.47	50.33	46.86	49.76	53.18	55.51	58.86	63.34	65.67	64.07
9	59.45	56.98	51.17	47.63	46.41	50.00	52.47	55.70	58.13	63.62	65.53	62.74	63.61	57.46	53.67	49.57	45.90	48.78	51.99	54.77	57.82	62.35	64.73	63.04
10	58.53	55.97	50.56	47.06	45.79	49.29	51.69	54.68	56.76	62.00	64.38	61.61	62.35	56.68	53.12	48.62	45.06	48.10	51.18	54.06	56.71	61.18	63.53	61.93
11	57.67	55.38	50.20	46.60	45.40	48.96	50.73	53.47	55.88	61.01	62.80	60.70	61.36	55.93	52.76	47.98	44.36	47.23	50.20	53.34	56.06	60.54	62.61	61.15

HOUR	1861										1862		1862												1863	
	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.		
Midnight	60.77	55.50	49.90	47.91	44.37	45.84	49.41	53.40	55.04	57.62	61.21	61.41	60.64	53.63	50.25	46.68	48.37	47.33	50.80	51.99	56.63	56.41	62.21	61.22		
1h AM	60.15	54.58	49.25	47.54	44.13	45.08	48.78	52.73	53.92	56.88	60.29	61.26	59.80	53.22	49.95	46.56	47.79	46.68	49.98	51.36	55.69	55.46	61.54	60.99		
2	59.50	54.08	48.56	47.20	43.84	44.33	48.03	52.32	53.38	56.39	59.55	61.18	59.39	52.68	49.40	46.24	47.59	46.28	49.50	51.30	55.02	54.68	60.72	60.50		
3	59.16	53.62	48.44	46.79	43.41	43.97	47.66	52.11	52.88	55.69	58.96	60.62	58.80	52.24	49.05	45.97	47.02	46.09	49.05	50.75	54.38	54.29	60.24	60.05		
4	58.99	53.14	48.43	46.43	43.18	43.38	46.83	51.65	52.33	55.35	58.52	60.49	58.15	51.78	48.92	45.77	46.71	46.05	48.63	50.38	53.53	53.78	59.99	59.81		
5	58.67	52.79	48.43	46.35	42.95	43.24	46.24	51.49	52.36	55.56	58.97	60.04	57.67	51.61	49.03	45.73	46.87	45.58	48.31	50.04	53.96	54.09	59.62	59.57		
6	58.65	52.62	48.22	46.33	42.61	43.09	45.98	52.69	54.65	57.54	61.25	60.19	57.40	51.55	48.73	45.53	46.96	45.47	48.49	50.97	57.04	56.65	61.34	60.18		
7	60.63	53.32	48.32	46.35	42.60	43.85	48.30	56.14	58.19	60.55	65.13	63.07	59.40	52.13	48.70	45.38	46.64	45.63	50.68	54.23	62.18	61.44	64.99	62.64		
8	63.48	55.69	49.86	47.20	43.56	45.72	51.93	59.00	60.70	63.58	68.37	65.44	62.73	54.92	50.15	46.18	47.44	47.38	54.11	57.69	65.83	64.98	69.05	65.45		
9	67.17	59.29	52.53	49.20	45.63	48.94	55.32	61.27	63.43	65.63	71.04	68.24	65.70	57.75	52.74	48.01	49.07	50.14	56.77	60.84	68.98	68.60	72.05	68.44		
10	69.69	62.65	55.40	51.54	48.34	52.25	58.24	63.45	64.91	67.44	73.58	70.31	69.11	60.23	55.15	50.34	51.72	52.55	59.25	63.36	71.07	69.88	73.79	70.64		
11	72.46	65.13	57.59	54.07	50.33	54.57	60.05	65.09	66.73	68.55	75.25	72.12	71.94	62.24	57.05	52.23	53.33	54.51	60.81	64.17	73.47	72.24	74.91	72.69		
Noon	72.96	66.82	58.53	55.97	51.99	55.43	61.56	65.94	68.01	69.59	77.17	73.75	74.35	63.46	57.75	53.66	54.21	55.82	62.18	65.23	74.81	72.87	76.16	72.45		
1h PM	74.67	67.51	59.65	57.05	52.50	56.84	62.27	66.54	68.88	70.28	78.19	74.66	75.02	64.29	58.38	54.52	54.43	56.63	62.74	65.94	73.62	74.03	76.13	73.37		
2	74.44	67.74	59.37	57.21	52.73	57.06	62.11	66.37	68.27	70.86	78.52	74.80	74.84	64.64	58.46	54.29	54.56	56.46	62.27	66.06	74.18	74.66	77.05	73.75		
3	73.90	67.33	59.02	56.94	52.06	56.42	61.85	66.34	67.59	70.86	77.62	74.06	74.96	64.55	57.40	53.43	53.90	55.85	61.71	64.98	73.82	73.95	76.99	73.57		
4	72.38	65.78	57.67	55.28	51.12	55.41	60.75	65.02	66.55	69.80	75.18	73.47	73.85	63.13	56.28	52.20	52.88	54.48	60.84	64.33	73.14	73.00	76.29	73.06		
5	70.64	63.80	55.33	53.11	48.99	53.34	58.81	63.63	65.96	68.07	73.94	71.83	71.58	61.35	54.29	50.43	51.36	52.47	59.01	62.75	70.75	70.71	74.03	71.69		
6	67.96	61.44	53.80	51.68	47.66	51.37	56.15	61.22	64.26	65.89	71.72	69.14	68.84	59.17	53.37	49.53	50.57	50.75	56.55	60.46	66.95	67.70	71.75	68.89		
7	65.76	59.90	52.82	50.81	46.69	49.92	54.65	58.87	61.17	63.01	68.74	66.34	66.65	57.81	52.65	48.97	50.07	49.99	55.09	57.73	63.56	64.10	68.59	66.17		
8	64.57	58.60	51.76	50.22	46.08	49.11	53.41	57.69	59.53	61.20	66.52	64.72	65.22	56.71	52.06	48.40	49.87	49.31	54.26	56.36	61.57	62.06	66.30	64.94		
9	63.41	57.73	50.91	49.44	45.43	48.21	52.58	56.65	58.23	60.11	65.47	63.57	63.48	55.44	51.80	47.97	49.63	48.64	53.18	54.83	59.59	60.12	65.03	63.50		
10	62.31	56.93	50.29	49.05	44.94	47.49	51.63	55.42	57.07	59.23	63.52	62.70	62.41	54.37	51.20	47.50	49.53	48.07	52.08	53.97	58.87	58.55	64.01	62.42		
11	61.65	56.22	49.90	48.43	44.39	46.57	50.49	54.49	56.00	58.36	61.98	61.69	61.49	53.93	50.82	47.02	49.29	47.49	51.40	53.00	57.75	57.58	63.28	61.65		

12. MONTHLY MEANS OF TEMPERATURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1859.										1860.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
S.	63.04	60.00	56.24	48.81	48.01	51.65	53.72	60.04	62.74	69.96	71.00	70.20
S. by E.	58.76	62.80	—	—	46.75	52.50	53.72	56.13	60.96	66.94	67.70	63.10
S.S.E.	56.15	52.70	—	46.46	41.57	53.60	52.58	60.07	61.30	63.94	69.50	62.20
S.E. by S.	55.00	57.40	58.50	45.53	—	52.66	43.60	58.51	55.61	64.63	71.50	65.10
S.E.	56.57	51.40	54.80	44.54	45.36	49.46	50.22	55.73	58.90	63.00	67.50	62.40
S.E. by E.	61.06	49.60	—	43.80	—	53.90	49.70	62.20	65.30	63.17	67.70	65.70
E.S.E.	57.80	53.30	—	45.85	47.85	43.50	53.22	56.05	57.81	61.70	68.70	66.40
E. by S.	59.97	50.00	—	59.20	47.50	56.97	55.13	58.15	—	66.16	69.90	63.80
E.	62.90	57.30	55.38	51.66	49.93	58.80	51.14	61.27	60.36	63.48	69.30	71.10
E. by N.	58.97	53.30	—	46.85	47.97	53.17	50.00	73.83	73.45	66.13	77.10	67.10
E.N.E.	59.20	53.10	50.21	45.18	47.27	50.89	49.67	63.28	54.47	72.56	63.70	77.80
N.E. by E.	61.70	41.10	52.14	41.05	41.96	46.67	51.70	66.12	63.27	68.80	60.90	66.60
N.E.	61.83	55.00	50.77	45.79	41.05	47.86	50.41	57.19	61.19	65.78	64.70	65.60
N.E. by N.	69.45	59.00	53.15	49.14	45.27	51.93	52.42	70.64	61.48	66.65	81.30	73.10
N.N.E.	72.54	64.10	54.88	49.14	48.63	54.17	53.01	65.12	65.61	77.97	79.20	68.80
N. by E.	68.70	65.60	52.37	51.81	50.26	54.49	58.67	65.65	79.61	80.58	93.00	66.50
N.	74.76	64.50	53.16	50.41	50.72	54.85	57.82	64.55	70.14	83.82	81.30	71.70
N. by W.	69.10	65.30	53.90	50.48	48.01	51.05	52.92	60.49	66.67	70.09	80.50	67.90
N.N.W.	67.44	62.60	52.97	49.88	48.64	48.97	52.92	58.59	61.01	74.01	84.80	72.80
N.W. by N.	59.60	60.60	50.44	47.94	45.35	52.21	46.60	56.83	66.54	—	93.30	63.20
N.W.	59.70	54.90	52.27	49.32	47.68	50.51	50.53	51.73	56.93	68.55	67.60	58.90
N.W. by W.	56.20	55.10	49.62	44.69	44.58	45.68	53.70	51.55	65.73	61.53	62.80	59.00
W.N.W.	64.30	57.30	51.57	48.91	45.78	48.80	52.75	54.54	57.21	60.37	62.20	61.60
W. by N.	61.60	54.00	50.73	49.04	47.83	47.07	50.23	53.40	60.78	65.25	59.10	54.80
W.	59.26	56.90	52.96	49.22	48.23	48.86	53.00	55.12	56.12	60.27	61.10	59.90
W. by S.	57.30	56.60	52.67	50.12	47.51	51.42	48.50	55.16	54.77	62.40	61.90	60.60
W.S.W.	58.95	56.00	54.20	48.18	47.48	50.57	52.24	58.04	58.68	64.84	65.10	66.04
S.W. by W.	59.84	56.60	54.31	49.75	49.47	50.70	50.66	58.30	55.76	62.48	63.05	61.00
S.W.	61.36	59.30	56.67	50.55	49.61	50.29	50.49	57.26	59.99	66.10	64.20	66.20
S.W. by S.	62.10	61.60	54.57	51.58	49.63	50.10	56.66	59.72	60.22	66.69	69.30	69.20
S.S.W.	62.70	61.10	57.16	51.04	50.85	50.53	52.64	59.62	61.07	67.83	62.50	67.90
S. by W.	63.30	60.80	53.83	49.99	49.55	53.67	50.57	60.82	60.07	68.96	69.00	66.80

12. MONTHLY MEANS OF TEMPERATURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1860										1861	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
S.	68.50	60.44	57.30	51.26	47.40	52.27	55.26	56.93	63.95	67.53	68.17	68.35
S. by E.	64.49	58.24	62.00	51.31	45.97	50.49	55.42	54.71	61.79	66.73	65.23	64.60
S.S.E.	62.26	59.04	52.20	48.92	49.15	52.21	51.63	53.10	60.90	62.67	63.60	63.36
S.E. by S.	61.93	57.13	52.00	49.90	50.50	54.60	54.10	52.43	59.68	66.38	63.61	63.74
S.E.	61.99	57.46	53.60	50.39	48.78	50.95	50.92	53.80	56.85	59.07	66.09	65.36
SE. by E.	58.87	57.56	52.00	46.90	48.27	45.50	54.27	52.65	56.51	60.80	67.02	63.36
E.S.E.	59.22	60.26	—	51.90	47.29	46.46	48.77	53.20	63.24	66.26	66.50	63.98
E. by S.	69.10	58.37	54.90	44.94	42.54	43.12	52.10	51.25	60.75	62.82	65.02	62.55
E.	61.64	61.31	56.40	47.26	42.09	47.65	51.14	51.71	61.06	60.33	63.79	65.00
E. by N.	82.00	55.10	57.30	49.30	45.67	—	51.67	53.34	62.50	65.47	71.21	58.92
E.N.E.	62.73	62.02	54.03	46.08	47.60	46.22	47.81	58.10	58.93	68.06	68.08	63.79
N.E. by E.	57.20	58.03	48.70	42.16	43.95	47.28	53.02	54.00	55.10	67.08	69.73	69.05
N.E.	63.86	58.44	50.71	43.93	43.89	46.94	52.12	56.54	62.16	68.57	68.58	62.41
N.E. by N.	65.38	60.57	56.09	50.75	48.05	51.44	58.59	56.61	71.40	70.49	73.02	66.33
N.N.E.	71.78	59.39	56.39	51.08	47.48	47.38	57.48	63.62	70.36	75.99	78.36	63.77
N. by E.	75.78	63.75	56.25	51.62	49.50	50.91	58.48	65.07	75.58	80.05	81.63	68.43
N.	72.18	60.79	56.60	51.64	49.89	50.37	59.52	65.43	72.07	75.34	79.08	71.25
N. by W.	71.27	56.60	56.67	51.22	49.10	52.14	57.89	59.48	65.92	58.53	72.82	66.02
N.N.W.	70.28	56.72	55.56	53.87	49.17	51.12	55.70	55.98	56.49	65.05	83.38	64.25
N.W. by N.	70.26	60.42	57.35	53.43	48.20	52.40	46.87	52.64	59.50	56.26	70.05	66.51
N.W.	65.40	55.92	54.10	50.98	46.31	49.52	51.32	52.48	56.80	59.98	65.61	63.86
N.W. by W.	63.68	55.29	53.29	48.58	43.74	45.43	50.59	55.02	61.53	62.26	68.94	68.90
W.N.W.	58.05	52.44	51.75	54.33	48.28	50.29	51.12	54.81	55.13	61.10	64.67	63.34
W. by N.	67.93	56.23	54.59	52.54	49.00	54.11	51.91	60.00	52.18	58.59	58.32	66.05
W.	63.24	57.57	54.37	51.15	49.19	47.79	49.42	52.78	51.58	58.22	61.39	62.93
W. by S.	59.88	59.81	55.39	52.85	51.94	49.53	50.41	52.67	51.42	55.82	60.03	61.16
W.S.W.	64.79	58.88	53.76	52.43	50.61	49.92	51.52	55.25	57.94	59.83	63.22	61.77
S.W. by W.	63.19	62.95	54.40	53.53	50.60	50.33	50.18	54.00	53.20	59.67	63.08	65.83
S.W.	64.04	56.14	55.18	50.40	48.12	51.87	54.32	57.12	61.32	61.73	65.37	66.94
S.W. by S.	68.59	61.44	54.74	50.30	53.50	54.58	52.90	54.46	59.67	66.61	68.99	67.80
S.S.W.	68.91	61.64	55.36	51.50	48.61	51.76	54.76	57.95	60.95	66.29	66.66	70.34
S. by W.	66.65	64.71	55.47	53.51	50.43	55.06	55.53	58.59	62.86	63.54	70.48	73.25

12. MONTHLY MEANS OF TEMPERATURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1861										1862	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
S.	65.95	62.81	58.20	51.07	49.93	51.95	57.78	58.79	61.80	65.99	66.72	68.81
S. by E.	65.74	62.39	59.20	51.24	48.90	50.76	58.02	56.85	61.70	63.36	63.68	63.11
S.S.E.	62.18	62.14	57.20	51.30	46.86	51.00	54.18	55.98	62.40	60.36	63.70	64.70
S.E. by S.	61.66	57.66	58.30	—	50.65	55.85	53.20	52.92	55.80	61.87	64.23	65.27
SE.	60.79	57.54	55.80	46.90	48.65	47.04	53.49	54.48	56.10	56.84	61.58	60.85
S.E. by E.	58.99	56.15	59.00	—	51.26	51.80	53.97	—	61.90	56.80	53.70	60.82
E.S.E.	57.39	58.70	63.50	48.00	—	48.95	54.87	53.30	61.40	57.45	63.26	64.04
E. by S.	63.20	59.18	—	49.10	47.77	50.75	55.50	—	61.20	61.75	—	62.85
E.	61.64	63.46	55.00	50.80	48.17	46.25	50.62	56.48	61.60	60.26	61.52	61.93
E. by N.	64.45	65.57	56.80	51.82	45.75	46.26	54.10	58.21	68.20	65.36	69.80	61.00
E.N.E.	62.13	61.23	52.60	48.45	46.21	51.39	48.02	54.95	55.01	59.86	72.33	61.01
N.E. by E.	66.05	53.80	54.80	45.88	38.66	47.67	56.85	57.40	60.30	59.47	64.89	68.14
N.E.	65.16	55.23	50.20	47.23	41.54	47.78	50.56	61.32	62.34	64.70	71.31	66.20
N.E. by N.	67.96	62.94	54.60	48.07	48.60	52.02	59.90	65.72	70.00	73.01	73.74	93.30
N.N.E.	73.10	62.99	52.50	50.33	48.55	50.95	57.30	60.99	65.50	67.01	78.10	77.83
N. by E.	75.44	61.04	56.10	52.71	49.07	53.09	55.95	66.49	65.10	64.44	82.87	78.32
N.	78.88	62.06	56.20	52.59	47.80	51.67	59.73	64.15	68.40	65.99	84.96	82.46
N. by W.	70.10	61.85	52.28	52.07	45.34	49.67	61.12	58.11	63.70	65.68	84.73	87.25
N.N.W.	71.81	61.32	53.93	51.67	48.50	48.20	54.35	59.51	62.00	67.05	79.90	69.66
N.W. by N.	69.88	57.72	53.30	46.59	46.10	49.30	54.70	62.16	67.60	67.30	66.50	68.10
N.W.	69.22	56.23	49.00	48.99	45.59	47.91	52.00	56.92	54.79	62.94	66.50	64.65
N.W. by W.	71.10	50.00	48.90	51.80	46.40	44.48	51.83	58.99	48.42	62.33	71.50	—
W.N.W.	61.77	54.71	48.80	53.62	47.60	43.90	50.67	57.43	54.09	61.00	78.80	67.87
W. by N.	62.40	55.68	49.40	52.23	48.90	44.37	55.49	59.13	53.53	58.20	58.55	64.30
W.	59.53	54.49	49.10	51.55	47.35	46.89	50.00	55.43	57.37	61.49	59.25	60.10
W. by S.	60.67	55.93	52.50	54.03	48.78	50.65	52.57	53.80	53.97	52.60	61.95	63.08
W.S.W.	64.30	62.61	53.40	54.70	46.90	48.97	51.96	54.63	58.57	60.24	63.80	64.86
S.W. by W.	60.55	—	52.40	—	51.57	52.95	53.78	52.46	58.76	57.65	62.15	64.83
S.W.	65.30	62.63	54.40	52.60	49.85	50.91	52.94	58.20	60.61	60.12	66.97	69.34
S.W. by S.	66.50	63.05	55.50	53.70	53.00	51.02	59.00	60.12	60.87	62.39	68.67	64.76
S.S.W.	68.44	62.00	54.50	54.10	48.95	50.60	55.68	58.32	60.41	63.63	68.40	67.92
S. by W.	67.53	61.81	56.40	51.65	50.90	51.92	56.42	60.33	62.37	62.63	66.97	70.61

12. MONTHLY MEANS OF TEMPERATURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1862.										1863.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December	January.	February.
S.	68.82	60.13	52.94	49.34	50.70	49.59	55.52	54.03	62.42	64.85	66.95	64.54
S. by E.	64.43	60.42	50.63	48.78	48.73	49.64	52.08	52.82	61.90	62.54	64.23	63.54
S.S.E.	67.01	59.03	50.95	48.18	50.20	48.50	52.77	50.98	56.11	60.86	62.87	66.63
S.E. by S.	59.49	—	58.40	49.78	—	43.45	51.00	52.15	62.42	59.00	64.89	59.66
S.E.	51.04	59.05	50.55	48.61	—	47.33	55.95	49.80	59.99	57.70	62.90	64.41
S.E. by E.	60.30	56.05	52.22	53.50	—	—	47.20	44.53	54.43	55.10	64.59	61.87
E.S.E.	67.00	62.23	45.84	52.10	—	44.15	50.50	51.57	53.87	53.48	62.27	60.58
E. by S.	68.37	53.70	45.20	—	—	46.10	—	52.21	52.96	60.43	78.30	59.10
E.	68.24	60.47	48.65	46.50	—	44.80	46.54	52.78	58.90	61.33	70.29	59.74
E. by N.	68.36	51.35	46.92	45.80	—	42.90	47.22	56.68	58.47	60.51	68.72	71.93
E.N.E.	68.16	59.85	50.51	41.73	44.90	46.30	50.66	51.26	57.98	60.53	58.85	62.38
N.E. by E.	60.86	59.66	53.35	46.55	47.70	44.30	53.22	57.50	53.80	62.03	74.60	62.17
N.E.	62.48	52.08	50.64	47.81	47.95	48.27	54.71	57.68	66.01	56.87	69.13	69.35
N.E. by N.	62.38	61.51	54.76	47.44	49.91	46.93	45.66	71.40	67.00	55.60	67.13	73.90
N.N.E.	67.55	57.63	51.64	48.97	50.05	50.13	60.53	65.11	64.21	68.28	75.99	69.03
N. by E.	72.80	63.53	53.71	51.12	51.57	55.41	59.43	69.91	76.15	68.06	82.38	81.04
N.	76.21	63.41	55.16	51.89	50.97	52.96	59.70	71.20	76.29	73.99	79.67	86.67
N. by W.	69.72	71.16	51.96	49.40	50.98	55.12	54.36	66.56	69.39	75.28	78.15	96.60
N.N.W.	65.73	51.02	53.85	47.30	50.81	52.75	55.15	61.68	69.41	64.32	60.16	92.62
N.W. by N.	68.43	52.40	56.21	49.80	50.08	48.54	58.83	51.10	68.46	81.50	75.20	50.70
N.W.	60.52	55.65	51.91	46.33	46.94	48.71	54.25	61.59	65.47	62.45	63.15	70.93
N.W. by W.	59.04	50.78	50.70	47.50	49.12	50.21	53.66	71.50	67.37	60.23	61.60	67.00
W.N.W.	65.33	55.61	52.58	46.58	48.49	48.07	53.59	50.25	67.59	58.40	64.98	59.17
W. by N.	62.56	53.94	52.41	44.72	50.52	47.45	53.34	57.38	66.04	63.46	59.40	65.83
W.	60.70	52.23	53.51	47.64	49.88	48.30	51.72	59.97	58.02	63.56	60.88	59.62
W. by S.	61.47	53.45	54.00	50.44	49.98	48.51	53.22	58.88	58.64	65.45	63.07	61.07
W.S.W.	63.76	56.95	51.77	48.58	50.64	47.83	53.83	56.95	58.95	64.49	62.76	62.81
S.W. by W.	61.80	59.80	50.20	50.00	47.52	51.64	55.03	57.66	59.71	63.70	65.27	64.70
S.W.	63.94	57.55	53.08	51.64	50.61	49.76	54.00	55.54	64.10	64.87	67.31	65.01
S.W. by S.	66.75	64.60	54.67	48.95	48.03	49.50	53.16	60.59	67.43	68.44	73.97	68.92
S.S.W.	65.50	60.25	55.09	51.00	53.65	50.02	54.31	57.20	65.95	70.59	70.91	68.16
S. by W.	67.35	59.50	54.02	50.70	53.13	48.59	55.94	57.48	66.57	68.87	68.17	66.54

12. MEAN MONTHLY MEANS OF TEMPERATURE OF AIR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.
S.	66° 539	61° 241	56° 103	50° 167	48° 232	51° 101	51° 658	58° 322	62° 980	67° 325	67° 884	68° 040
S. by E.	65 010	61 484	56 620	50 850	46 822	50 825	53 726	53 550	61 720	64 888	64 720	65 450
S.S.E.	62 042	58 430	54 054	48 520	46 185	49 478	52 610	54 468	60 080	61 983	64 130	63 860
S.E. by S.	60 910	58 070	55 905	48 990	49 465	52 331	51 050	55 476	60 190	62 567	64 950	63 890
S.E.	58 480	56 803	53 677	48 914	48 124	49 560	52 094	53 520	57 545	59 820	64 090	62 540
S.E. by E.	59 932	54 804	50 322	46 560	48 704	47 790	54 190	50 054	58 235	59 970	64 890	62 425
E.S.E.	60 733	58 450	52 950	47 434	46 814	46 494	51 597	53 547	58 544	57 849	65 170	62 232
E. by S.	64 327	57 426	49 797	49 460	45 039	46 857	55 002	54 130	59 770	62 913	68 919	60 766
E.	64 151	58 814	52 733	49 178	43 911	49 447	50 237	55 589	61 069	63 295	66 977	61 948
E. by N.	66 830	59 985	54 432	49 762	47 201	48 940	50 060	59 530	62 815	64 610	73 850	64 850
E.N.E.	64 024	58 819	52 570	45 828	47 127	49 095	49 135	57 298	58 179	64 937	70 055	63 901
N.E. by E.	62 946	53 403	52 976	43 342	42 234	47 023	51 707	58 502	62 530	64 705	68 420	68 202
N.E.	63 947	54 540	50 779	45 235	42 992	47 452	51 453	58 447	62 088	64 681	69 112	65 750
N.E. by N.	67 160	59 699	55 076	48 317	46 605	50 019	54 333	62 322	68 761	69 034	74 066	73 240
N.N.E.	71 314	60 405	53 719	49 381	48 634	50 860	56 803	64 290	66 589	70 390	76 728	71 735
N. by E.	74 157	63 125	55 092	51 226	49 924	53 903	57 246	66 368	72 640	73 517	83 025	72 973
N.	74 799	62 981	55 490	51 524	49 533	52 989	58 515	65 601	72 423	75 197	80 990	76 322
N. by W.	69 097	61 385	53 950	50 720	47 959	52 686	55 338	60 905	70 720	67 487	78 690	70 270
N.N.W.	68 345	59 099	53 745	50 309	49 166	51 302	54 603	57 860	67 894	67 333	78 334	70 105
N.W. by N.	63 030	59 902	53 639	49 060	47 538	49 270	51 997	56 101	65 107	63 491	72 640	67 860
N.W.	63 749	56 170	51 775	48 408	46 657	48 884	51 455	54 013	58 825	61 492	65 150	65 928
N.W. by W.	62 752	54 750	51 257	47 090	46 681	47 746	52 327	54 504	61 671	60 206	67 583	63 184
W.N.W.	62 999	55 970	51 007	48 403	47 146	48 420	52 162	54 660	58 681	61 072	66 777	61 683
W. by N.	62 479	55 882	51 404	48 200	48 580	48 580	51 564	53 935	60 655	60 743	61 446	60 217
W.	60 666	55 636	52 980	49 630	48 390	48 667	50 808	56 750	55 921	59 658	60 580	59 760
W. by S.	59 660	56 270	53 520	51 130	48 874	49 940	49 554	54 890	56 485	58 589	61 728	60 916
W.S.W.	63 926	57 090	53 321	49 790	48 069	48 925	51 967	55 950	58 807	60 723	63 630	61 930
S.W. by W.	62 267	58 030	53 597	51 110	51 801	49 894	51 051	54 440	59 299	60 653	63 850	64 702
S.W.	64 128	59 567	54 264	51 774	49 102	50 863	52 445	56 516	60 830	63 030	65 840	65 730
S.W. by S.	65 206	61 819	55 474	51 170	49 954	51 095	54 685	57 431	61 790	66 397	69 123	66 263
S.S.W.	66 671	61 026	55 004	51 488	49 882	51 016	54 367	58 126	62 221	67 350	68 456	68 550
S. by W.	69 435	61 223	55 499	51 554	50 260	52 325	54 384	58 730	62 790	67 333	68 437	68 287

13. HOURLY VARIATION IN PRESSURE OF VAPOR.

HOUR.	1859.											1860.		1860.											1861.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	Jan.	Febr.
Midnight	0.353	0.306	0.285	0.275	0.246	0.270	0.286	0.319	0.353	0.391	0.417	0.398	0.409	0.377	0.307	0.278	0.253	0.272	0.280	0.316	0.333	0.384	0.444	0.441	0.444	0.441
1 ^h A M	.353	.304	.283	.274	.243	.265	.281	.317	.348	.382	.412	.390	.410	.371	.304	.282	.251	.270	.276	.310	.335	.386	.441	.436	.441	.436
2	.347	.304	.284	.273	.239	.265	.276	.314	.347	.375	.406	.386	.403	.369	.299	.268	.250	.267	.275	.309	.332	.385	.437	.432	.437	.432
3	.346	.305	.281	.271	.237	.264	.271	.311	.345	.375	.399	.381	.402	.366	.295	.267	.247	.265	.267	.306	.333	.386	.436	.426	.436	.426
4	.343	.299	.282	.269	.236	.261	.271	.310	.340	.368	.400	.382	.401	.364	.292	.267	.246	.263	.264	.304	.327	.385	.431	.425	.431	.425
5	.333	.300	.282	.271	.232	.260	.270	.302	.338	.366	.396	.377	.395	.361	.293	.264	.244	.260	.264	.303	.329	.387	.424	.419	.424	.419
6	.328	.298	.281	.271	.234	.259	.266	.312	.339	.376	.398	.370	.391	.357	.292	.262	.242	.259	.263	.307	.336	.393	.426	.412	.426	.412
7	.332	.307	.281	.271	.233	.258	.277	.325	.342	.383	.409	.390	.402	.363	.296	.261	.237	.267	.280	.311	.351	.400	.429	.419	.429	.419
8	.345	.313	.287	.272	.240	.263	.287	.325	.339	.379	.405	.389	.409	.372	.304	.268	.246	.274	.291	.320	.346	.384	.436	.429	.436	.429
9	.350	.312	.294	.281	.248	.269	.294	.324	.336	.379	.411	.390	.421	.385	.309	.276	.259	.284	.292	.326	.349	.390	.431	.432	.431	.432
10	.340	.312	.298	.289	.253	.274	.301	.330	.340	.382	.407	.383	.423	.393	.315	.289	.273	.286	.294	.330	.357	.392	.429	.432	.429	.432
11	.336	.309	.296	.294	.260	.276	.302	.326	.343	.388	.406	.395	.422	.399	.307	.278	.279	.287	.294	.327	.360	.397	.429	.434	.429	.434
Noon	.335	.315	.299	.299	.260	.278	.300	.321	.337	.373	.404	.391	.416	.398	.313	.280	.283	.295	.326	.354	.401	.426	.435	.426	.435	.426
1 ^h P M	.333	.310	.293	.302	.259	.277	.307	.328	.332	.372	.409	.394	.414	.399	.307	.301	.275	.283	.292	.330	.342	.400	.443	.445	.443	.445
2	.332	.317	.287	.300	.258	.282	.310	.323	.343	.374	.408	.398	.417	.392	.313	.297	.278	.278	.295	.331	.340	.393	.423	.459	.423	.459
3	.347	.311	.286	.300	.256	.282	.304	.327	.340	.374	.405	.404	.413	.392	.314	.298	.278	.278	.291	.330	.342	.399	.421	.457	.421	.457
4	.351	.307	.286	.299	.258	.284	.301	.326	.348	.377	.416	.409	.409	.391	.319	.294	.276	.281	.291	.324	.343	.404	.420	.456	.420	.456
5	.356	.311	.291	.294	.258	.281	.300	.332	.354	.386	.419	.405	.416	.388	.319	.292	.273	.286	.292	.324	.344	.410	.430	.461	.430	.461
6	.355	.317	.290	.293	.259	.279	.301	.339	.352	.390	.420	.407	.416	.394	.322	.292	.273	.289	.293	.326	.339	.423	.452	.456	.452	.456
7	.360	.314	.289	.291	.259	.279	.304	.323	.353	.392	.424	.408	.420	.391	.319	.291	.269	.290	.289	.328	.340	.418	.448	.462	.448	.462
8	.356	.319	.288	.286	.258	.277	.304	.343	.354	.391	.430	.407	.417	.388	.315	.288	.268	.287	.289	.326	.338	.405	.453	.461	.453	.461
9	.352	.317	.284	.285	.254	.275	.304	.340	.353	.389	.425	.404	.417	.386	.319	.285	.264	.285	.292	.327	.337	.397	.444	.456	.444	.456
10	.349	.310	.282	.281	.253	.273	.301	.330	.354	.392	.428	.408	.416	.382	.321	.282	.261	.282	.288	.321	.334	.395	.446	.455	.446	.455
11	.348	.309	.280	.279	.248	.269	.299	.325	.349	.392	.421	.398	.414	.380	.312	.283	.255	.280	.293	.320	.333	.397	.449	.451	.449	.451

HOUR.	1861.											1862.		1862.											1863.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	Jan.	Febr.
Midnight	0.416	0.377	0.300	0.273	0.258	0.269	0.278	0.315	0.330	0.372	0.389	0.399	0.407	0.335	0.305	0.281	0.279	0.272	0.289	0.326	0.333	0.360	0.413	0.425	0.413	0.425
1 ^h A M	.411	.370	.297	.271	.264	.264	.281	.308	.328	.370	.388	.393	.404	.332	.299	.281	.278	.267	.286	.320	.331	.358	.413	.426	.413	.426
2	.407	.367	.295	.270	.254	.257	.279	.303	.324	.368	.381	.396	.398	.327	.294	.279	.277	.265	.281	.315	.325	.354	.408	.419	.408	.419
3	.403	.365	.292	.269	.252	.256	.274	.301	.320	.361	.378	.393	.396	.323	.292	.276	.277	.262	.278	.313	.319	.345	.406	.414	.406	.414
4	.399	.364	.289	.266	.248	.252	.268	.294	.319	.354	.372	.393	.389	.316	.291	.275	.273	.261	.272	.305	.316	.342	.399	.416	.399	.416
5	.395	.360	.289	.267	.247	.250	.262	.292	.314	.349	.358	.390	.387	.314	.290	.272	.274	.258	.273	.303	.313	.344	.395	.411	.395	.411
6	.395	.358	.288	.266	.245	.249	.259	.297	.323	.354	.364	.386	.390	.312	.288	.271	.275	.256	.271	.312	.325	.352	.401	.411	.401	.411
7	.402	.358	.286	.266	.245	.254	.266	.310	.324	.360	.365	.402	.395	.315	.287	.268	.275	.257	.281	.334	.334	.358	.407	.423	.407	.423
8	.411	.376	.294	.270	.251	.259	.280	.313	.327	.358	.370	.408	.403	.330	.294	.271	.277	.266	.298	.348	.333	.359	.411	.430	.411	.430
9	.406	.390	.305	.282	.259	.277	.290	.311	.326	.350	.370	.408	.405	.341	.306	.281	.285	.277	.306	.366	.341	.359	.422	.433	.422	.433
10	.420	.389	.310	.291	.269	.288	.284	.308	.331	.343	.373	.414	.417	.344	.312	.291	.293	.280	.307	.367	.340	.360	.423	.438	.423	.438
11	.412	.398	.314	.299	.272	.290	.281	.314	.336	.346	.383	.418	.409	.342	.315	.298	.294	.285	.310	.371	.337	.359	.439	.441	.439	.441
Noon	.415	.397	.317	.296	.274	.287	.280	.320	.337	.345	.385	.413	.412	.343	.316	.297	.294	.285	.304	.371	.334	.367	.426	.446	.426	.446
1 ^h P M	.414	.399	.312	.298	.272	.285	.278	.325	.329	.343	.383	.406	.406	.344	.313	.303	.297	.285	.310	.375	.337	.372	.425	.444	.425	.444
2	.434	.394	.307	.295	.268	.287	.288	.315	.338	.340	.380	.408	.402	.341	.318	.299	.298	.280	.309	.363	.352	.375	.419	.448	.419	.448
3	.429	.401	.310	.295	.270	.289	.290	.307	.338	.338	.390	.399	.400	.337	.318	.299	.295	.281	.308	.368	.363	.372	.414	.447	.414	.447
4	.425	.400	.304	.295	.271	.285	.282	.308	.336	.346	.385	.397	.403	.332	.314	.296	.296	.280	.301	.362	.363	.372	.415	.439	.415	.439
5	.421	.396	.311	.294	.269	.289	.292	.310	.332	.348	.383	.400	.408	.331	.316	.294	.293	.283	.302	.366	.358	.372	.418	.448	.418	.448
6	.425	.401	.312	.290	.271	.288	.293	.323	.329	.358	.386	.401	.415	.327	.317	.292	.289	.285	.301	.367	.344	.387	.418	.443	.418	.443
7	.418	.403	.311	.291	.268	.286	.289	.327	.345	.364	.400	.404	.410	.333	.314	.289	.289	.283	.301	.360	.349	.392	.408	.440	.408	.440
8	.420	.397	.306	.284	.263	.285	.291	.327	.345	.363	.396	.399	.406	.332	.315	.286	.288	.279	.298	.353	.345	.372	.411	.437	.411	.437
9	.415	.387	.306	.282	.264	.283	.285	.323	.343	.364	.401	.398	.413	.333	.313	.286	.288	.277	.299	.343	.344	.374	.418	.442	.418	.442
10	.420	.386	.302	.277	.262	.283	.280	.324	.340	.363	.391	.395	.411	.333	.313	.284	.285	.280	.295	.342	.340	.373	.422	.437	.422	.437
11	.413	.384	.298	.273	.260	.274	.281	.317	.340	.363	.396	.396	.409	.332	.309	.281	.283	.277	.293	.339	.337	.368	.418	.430	.418	.430

14. MONTHLY MEANS OF PRESSURE OF VAPOR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1859.										1860.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	0.367	0.323	0.325	0.278	0.262	0.272	0.292	0.337	0.339	0.390	0.430	0.391
S. by E.	0.353	0.355	—	—	0.260	0.251	0.291	0.326	0.339	0.391	0.393	0.376
S.S.E.	0.333	0.266	—	0.288	0.227	0.257	0.303	0.364	0.377	0.383	0.425	0.376
S.E. by S.	0.335	0.356	0.245	0.290	—	0.254	0.272	0.311	0.314	0.395	0.432	0.374
S.E.	0.334	0.276	0.252	0.264	0.241	0.249	0.277	0.348	0.363	0.381	0.446	0.364
S.E. by E.	0.349	0.269	—	0.263	—	0.241	0.254	0.308	0.438	0.398	0.447	0.345
E.S.E.	0.330	0.316	—	0.260	0.222	0.231	0.294	0.323	0.369	0.382	0.443	0.372
E. by S.	0.362	0.246	—	0.256	0.226	0.287	0.318	0.392	—	0.455	0.438	0.379
E.	0.353	0.329	0.310	0.277	0.231	0.369	0.293	0.349	0.387	0.379	0.474	0.397
E. by N.	0.347	0.321	—	0.265	0.245	0.337	0.294	0.345	0.425	0.430	0.509	0.424
E.N.E.	0.346	0.276	0.272	0.266	0.255	0.283	0.288	0.377	0.383	0.399	0.405	0.396
N.E. by E.	0.344	0.241	0.274	0.240	0.234	0.264	0.293	0.443	0.473	0.412	0.369	0.414
N.E.	0.331	0.295	0.285	0.266	0.229	0.258	0.283	0.353	0.416	0.394	0.406	0.400
N.E. by N.	0.344	0.311	0.286	0.285	0.242	0.272	0.307	0.353	0.387	0.384	0.373	0.466
N.N.E.	0.329	0.295	0.292	0.286	0.253	0.273	0.304	0.332	0.390	0.357	0.377	0.445
N. by E.	0.382	0.308	0.289	0.302	0.252	0.276	0.314	0.321	0.424	0.325	0.396	0.507
N.	0.303	0.300	0.288	0.284	0.259	0.275	0.301	0.339	0.362	0.357	0.371	0.416
N. by W.	0.323	0.297	0.282	0.283	0.244	0.255	0.278	0.296	0.353	0.327	0.505	0.406
N.N.W.	0.275	0.299	0.279	0.287	0.258	0.258	0.304	0.299	0.385	0.381	0.376	0.407
N.W. by N.	0.297	0.293	0.269	0.277	0.253	0.271	0.251	0.265	0.347	—	0.307	0.470
N.W.	0.322	0.299	0.271	0.288	0.275	0.267	0.292	0.271	0.324	0.401	0.368	0.419
N.W. by W.	0.336	0.320	0.268	0.267	0.245	0.264	0.265	0.298	0.417	0.399	0.351	0.359
W.N.W.	0.380	0.319	0.272	0.292	0.256	0.251	0.285	0.296	0.333	0.423	0.374	0.421
W. by N.	0.338	0.318	0.269	0.282	0.252	0.243	0.286	0.304	0.375	0.388	0.366	0.327
W.	0.330	0.315	0.294	0.302	0.271	0.261	0.304	0.259	0.324	0.324	0.345	0.380
W. by S.	0.338	0.335	0.292	0.308	0.270	0.268	0.278	0.259	0.302	0.291	0.397	0.333
W.S.W.	0.330	0.330	0.305	0.291	0.277	0.264	0.296	0.288	0.342	0.348	0.416	0.349
S.W. by W.	0.381	0.304	0.326	0.278	0.283	0.261	0.317	0.368	0.295	0.371	0.408	0.354
S.W.	0.372	0.322	0.345	0.298	0.270	0.263	0.297	0.323	0.356	0.396	0.413	0.413
S.W. by S.	0.366	0.353	0.338	0.286	0.281	0.250	0.316	0.318	0.320	0.406	0.459	0.409
S.S.W.	0.353	0.316	0.319	0.286	0.259	0.252	0.282	0.296	0.335	0.401	0.427	0.395
S. by W.	0.361	0.322	0.389	0.287	0.275	0.286	0.276	0.340	0.333	0.391	0.433	0.351

14. MONTHLY MEANS OF PRESSURE OF VAPOR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1860.										1861.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	0.422	0.400	0.334	0.279	0.282	0.277	0.281	0.311	0.339	0.417	0.436	0.451
S. by E.	0.374	0.416	0.331	0.304	0.241	0.260	0.289	0.309	0.347	0.374	0.434	0.455
S.S.E.	0.377	0.435	0.287	0.298	0.275	0.255	0.250	0.319	0.325	0.362	0.425	0.438
S.E. by S.	0.406	0.365	0.343	0.295	0.286	0.253	0.283	0.305	0.363	0.341	0.433	0.410
S.E.	0.395	0.411	0.369	0.288	0.281	0.258	0.252	0.300	0.324	0.344	0.425	0.428
S.E. by E.	0.389	0.387	0.312	0.280	0.268	0.233	0.252	0.295	0.308	0.398	0.449	0.409
E.S.E.	0.357	0.410	—	0.261	0.257	0.237	0.229	0.311	0.335	0.438	0.422	0.422
E. by S.	0.490	0.445	0.348	0.279	0.235	0.242	0.241	0.273	0.315	0.421	0.432	0.473
E.	0.411	0.444	0.332	0.288	0.247	0.246	0.296	0.314	0.371	0.496	0.452	0.454
E. by N.	0.580	0.392	0.364	0.275	0.268	—	0.254	0.342	0.384	0.417	0.502	0.408
E.N.E.	0.409	0.418	0.315	0.271	0.276	0.247	0.262	0.347	0.355	0.460	0.476	0.463
N.E. by E.	0.376	0.393	0.286	0.246	0.255	0.286	0.277	0.304	0.291	0.374	0.469	0.472
N.E.	0.417	0.403	0.303	0.248	0.245	0.271	0.285	0.329	0.354	0.456	0.477	0.448
N.E. by N.	0.424	0.386	0.294	0.259	0.255	0.310	0.320	0.349	0.413	0.442	0.482	0.465
N.N.E.	0.417	0.400	0.306	0.280	0.246	0.269	0.297	0.345	0.358	0.425	0.442	0.432
N. by E.	0.420	0.407	0.305	0.285	0.256	0.284	0.304	0.324	0.366	0.418	0.456	0.438
N.	0.389	0.365	0.313	0.284	0.257	0.269	0.304	0.370	0.359	0.373	0.442	0.425
N. by W.	0.429	0.348	0.303	0.284	0.272	0.278	0.332	0.336	0.322	0.347	0.429	0.389
N.N.W.	0.420	0.319	0.311	0.294	0.282	0.276	0.287	0.326	0.331	0.381	0.406	0.387
N.W. by N.	0.392	0.335	0.309	0.308	0.252	0.283	0.267	0.293	0.370	0.379	0.464	0.399
N.W.	0.399	0.365	0.301	0.298	0.262	0.273	0.255	0.301	0.344	0.390	0.484	0.442
N.W. by W.	0.421	0.337	0.290	0.299	0.252	0.268	0.266	0.313	0.351	0.483	0.388	0.432
W.N.W.	0.403	0.317	0.290	0.317	0.275	0.266	0.262	0.320	0.367	0.360	0.405	0.460
W. by N.	0.412	0.328	0.287	0.308	0.275	0.269	0.257	0.327	0.302	0.381	0.351	0.388
W.	0.426	0.341	0.317	0.313	0.271	0.275	0.274	0.323	0.293	0.387	0.406	0.429
W. by S.	0.405	0.397	0.314	0.339	0.300	0.276	0.273	0.321	0.289	0.350	0.392	0.450
W.S.W.	0.441	0.384	0.309	0.297	0.280	0.297	0.276	0.320	0.352	0.377	0.411	0.424
S.W. by W.	0.441	0.356	0.334	0.308	0.282	0.277	0.288	0.294	0.316	0.385	0.419	0.470
S.W.	0.437	0.369	0.331	0.299	0.291	0.296	0.279	0.309	0.338	0.392	0.402	0.468
S.W. by S.	0.429	0.404	0.344	0.276	0.320	0.281	0.297	0.303	0.309	0.398	0.438	0.442
S.S.W.	0.466	0.455	0.308	0.297	0.276	0.276	0.247	0.319	0.341	0.408	0.393	0.462
S. by W.	0.455	0.436	0.310	0.312	0.294	0.284	0.267	0.308	0.334	0.433	0.419	0.502

14. MONTHLY MEANS OF PRESSURE OF VAPOR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1861.										1862.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	0.385	0.366	0.337	0.294	0.286	0.293	0.270	0.309	0.346	0.357	0.384	0.395
S. by E.	0.394	0.365	0.353	0.282	0.266	0.283	0.282	0.289	0.322	0.359	0.354	0.385
S.S.E.	0.350	0.375	0.368	0.285	0.285	0.305	0.299	0.291	0.346	0.346	0.362	0.378
S.E. by S.	0.353	0.361	0.328	—	0.286	0.288	0.286	0.288	0.332	0.372	0.372	0.405
S.E.	0.345	0.381	0.376	—	0.293	0.264	0.274	0.328	0.313	0.313	0.361	0.365
S.E. by E.	0.545	0.400	0.352	—	0.259	0.264	0.292	—	0.366	0.347	0.319	0.365
E.S.E.	0.331	0.394	0.341	0.285	—	0.282	0.287	0.340	0.371	0.388	0.374	0.382
E. by S.	0.370	0.399	—	0.239	0.258	0.276	0.273	—	0.376	0.375	—	0.345
E.	0.393	0.403	0.328	0.302	0.276	0.251	0.270	0.359	0.355	0.372	0.353	0.378
E. by N.	0.369	0.419	0.304	0.313	0.260	0.243	0.343	0.349	0.384	0.396	0.329	0.323
E.N.E.	0.409	0.401	0.337	0.281	0.258	0.283	0.270	0.330	0.313	0.393	0.407	0.396
N.E. by E.	0.353	0.441	0.337	0.263	0.219	0.249	0.292	0.321	0.349	0.404	0.414	0.437
N.E.	0.441	0.374	0.297	0.275	0.238	0.263	0.271	0.313	0.339	0.441	0.412	0.406
N.E. by N.	0.442	0.408	0.295	0.282	0.269	0.280	0.279	0.314	0.358	0.422	0.394	0.471
N.N.E.	0.481	0.415	0.306	0.272	0.279	0.280	0.291	0.283	0.322	0.416	0.358	0.348
N. by E.	0.454	0.385	0.308	0.283	0.276	0.288	0.291	0.312	0.335	0.341	0.372	0.353
N.	0.460	0.418	0.321	0.288	0.267	0.280	0.289	0.314	0.328	0.349	0.367	0.279
N. by W.	0.446	0.389	0.287	0.287	0.247	0.278	0.313	0.303	0.363	0.333	0.396	0.316
N.N.W.	0.502	0.411	0.315	0.275	0.248	0.275	0.290	0.299	0.332	0.328	0.405	0.462
N.W. by N.	0.493	0.381	0.340	0.255	0.247	0.266	0.248	0.264	0.258	0.360	0.420	0.454
N.W.	0.462	0.378	0.296	0.252	0.238	0.278	0.274	0.303	0.291	0.317	0.364	0.482
N.W. by W.	0.392	0.302	0.265	0.272	0.242	0.265	0.300	0.287	0.269	0.318	0.433	—
W.N.W.	0.420	0.302	0.274	0.299	0.270	0.257	0.374	0.324	0.325	0.328	0.419	0.433
W. by N.	0.493	0.335	0.264	0.265	0.256	0.247	0.261	0.279	0.308	0.334	0.316	0.501
W.	0.393	0.335	0.277	0.306	0.260	0.268	0.273	0.321	0.331	0.326	0.356	0.397
W. by S.	0.382	0.249	0.289	0.268	0.270	0.287	0.284	0.332	0.299	0.317	0.393	0.399
W.S.W.	0.403	0.378	0.305	0.221	0.264	0.292	0.280	0.306	0.312	0.354	0.399	0.451
S.W. by W.	0.372	—	0.295	—	0.280	0.289	0.268	0.297	0.312	0.313	0.423	0.476
S.W.	0.424	0.417	0.312	0.327	0.285	0.283	0.282	0.328	0.340	0.317	0.407	0.453
S.W. by S.	0.395	0.322	0.314	0.286	0.290	0.285	0.306	0.298	0.369	0.272	0.387	0.369
S.S.W.	0.414	0.407	0.301	0.322	0.255	0.288	0.276	0.308	0.332	0.326	0.395	0.444
S. by W.	0.404	0.395	0.340	0.305	0.290	0.281	0.283	0.311	0.331	0.313	0.392	0.415

14. MONTHLY MEANS OF PRESSURE OF VAPOR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1862.										1863.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S	0.432	0.347	0.318	0.258	0.299	0.252	0.323	0.316	0.346	0.376	0.403	0.459
S. by E.	0.420	0.372	0.314	0.258	0.292	0.269	0.317	0.314	0.356	0.339	0.384	0.462
S.S.E.	0.416	0.375	0.303	0.253	0.326	0.253	0.309	0.310	0.308	0.364	0.385	0.463
S.E. by S.	0.368	—	0.312	0.268	—	0.214	0.344	0.277	0.323	0.356	0.366	0.390
S.E.	0.424	0.363	0.293	0.267	—	0.269	0.349	0.298	0.341	0.348	0.366	0.490
S.E. by E.	0.397	0.354	0.280	0.294	—	—	0.385	0.276	0.315	0.338	0.386	0.445
E.S.E.	0.433	0.428	0.256	0.281	—	0.243	0.320	0.336	0.304	0.309	0.348	0.394
E. by S.	0.366	0.271	0.233	—	—	0.265	—	0.353	0.378	0.339	0.488	0.429
E.	0.429	0.344	0.293	0.250	—	0.256	0.291	0.338	0.340	0.383	0.462	0.418
E. by N.	0.419	0.282	0.275	0.273	—	0.228	0.298	0.364	0.326	0.367	0.514	0.458
E.N.E.	0.436	0.359	0.321	0.237	0.262	0.252	0.304	0.299	0.352	0.366	0.435	0.470
N.E. by E.	0.410	0.293	0.347	0.241	0.291	0.232	0.277	0.361	0.286	0.403	0.362	0.472
N.E.	0.404	0.306	0.296	0.285	0.290	0.271	0.284	0.358	0.319	0.351	0.455	0.499
N.E. by N.	0.413	0.312	0.340	0.289	0.295	0.264	0.280	0.520	0.301	0.405	0.442	0.457
N.N.E.	0.392	0.286	0.296	0.289	0.285	0.259	0.284	0.406	0.345	0.379	0.493	0.448
N. by E.	0.381	0.394	0.298	0.255	0.289	0.288	0.309	0.349	0.314	0.427	0.412	0.448
N.	0.394	0.303	0.306	0.306	0.281	0.281	0.308	0.398	0.307	0.386	0.430	0.404
N. by W.	0.384	0.297	0.314	0.280	0.285	0.302	0.281	0.415	0.309	0.356	0.443	0.307
N.N.W.	0.354	0.290	0.326	0.280	0.274	0.292	0.289	0.346	0.284	0.412	0.418	0.334
N.W. by N.	0.333	0.333	0.329	0.286	0.272	0.284	0.274	0.371	0.332	0.325	0.397	0.275
N.W.	0.344	0.332	0.305	0.276	0.259	0.279	0.290	0.404	0.337	0.308	0.388	0.475
N.W. by W.	0.400	0.282	0.312	0.287	0.248	0.279	0.273	0.451	0.286	0.350	0.417	0.598
W.N.W.	0.422	0.318	0.298	0.265	0.283	0.258	0.291	0.312	0.320	0.359	0.431	0.359
W. by N.	0.394	0.317	0.305	0.257	0.310	0.263	0.288	0.349	0.322	0.384	0.376	0.364
W.	0.372	0.321	0.304	0.280	0.287	0.269	0.283	0.365	0.319	0.358	0.369	0.410
W. by S.	0.356	0.324	0.318	0.295	0.306	0.285	0.267	0.348	0.312	0.349	0.419	0.411
W.S.W.	0.419	0.372	0.386	0.315	0.331	0.281	0.303	0.334	0.353	0.407	0.410	0.428
S.W. by W.	0.387	0.373	0.265	0.290	0.300	0.278	0.313	0.319	0.302	0.347	0.471	0.483
S.W.	0.412	0.350	0.319	0.317	0.304	0.282	0.318	0.369	0.379	0.380	0.447	0.427
S.W. by S.	0.447	0.355	0.333	0.303	0.288	0.291	0.330	0.353	0.341	0.394	0.413	0.400
S.S.W.	0.386	0.367	0.311	0.299	0.328	0.264	0.315	0.338	0.349	0.382	0.420	0.429
S. by W.	0.452	0.346	0.301	0.279	0.296	0.271	0.331	0.326	0.335	0.380	0.412	0.443

14. MEAN MONTHLY MEANS OF PRESSURE OF VAPOR FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.	inch.
S.	0.4045	0.3612	0.3454	0.2830	0.2767	0.2880	0.2525	0.3307	0.3493	0.3946	0.4160	0.4270
S. by E.	0.4029	0.3784	0.3377	0.3054	0.2631	0.2790	0.2957	0.3199	0.3505	0.3753	0.4030	0.4220
S.S.E.	0.3821	0.3660	0.3386	0.2830	0.2769	0.2580	0.2921	0.3180	0.3506	0.3766	0.4010	0.4010
S.E. by S.	0.3822	0.3590	0.3480	0.2760	0.2806	0.2537	0.2928	0.3180	0.3750	0.3820	0.4107	0.3987
S.E.	0.3830	0.3700	0.3578	0.2852	0.2801	0.2650	0.2830	0.3170	0.3455	0.3650	0.4060	0.3943
S.E. by E.	0.3813	0.3480	0.3706	0.2870	0.2694	0.2370	0.2726	0.2970	0.3676	0.3919	0.4266	0.3953
E.S.E.	0.3759	0.3730	0.3140	0.2776	0.2568	0.2420	0.2723	0.3190	0.3476	0.3649	0.4070	0.3924
E. by S.	0.3952	0.3670	0.3215	0.2835	0.2470	0.2560	0.3080	0.3527	0.3334	0.4018	0.4504	0.4106
E.	0.4121	0.3687	0.3330	0.2917	0.2575	0.2787	0.2865	0.3417	0.3864	0.4175	0.4580	0.3960
E. by N.	0.4352	0.3622	0.3442	0.2933	0.2744	0.2777	0.2910	0.3506	0.4086	0.4152	0.5150	0.4057
E.N.E.	0.4200	0.3642	0.3192	0.2681	0.2690	0.2724	0.2799	0.3437	0.3589	0.4079	0.4620	0.4277
N.E. by E.	0.4123	0.3379	0.3201	0.2560	0.2431	0.2639	0.2825	0.3598	0.4131	0.4131	0.4650	0.4448
N.E.	0.4162	0.3469	0.2865	0.2687	0.2493	0.2660	0.2804	0.3360	0.3636	0.4240	0.4578	0.4290
N.E. by N.	0.3934	0.3590	0.3185	0.2795	0.2655	0.2810	0.2967	0.3480	0.3645	0.4214	0.4657	0.4530
N.N.E.	0.4162	0.3484	0.3061	0.2820	0.2719	0.2722	0.2940	0.3340	0.3668	0.4015	0.4438	0.4127
N. by E.	0.4218	0.3530	0.3191	0.2830	0.2732	0.2864	0.2996	0.3321	0.3612	0.4029	0.4590	0.4255
N.	0.3977	0.3430	0.3171	0.2920	0.2725	0.2820	0.3007	0.3380	0.3393	0.3808	0.4304	0.4073
N. by W.	0.4108	0.3530	0.3033	0.2880	0.2700	0.2790	0.2982	0.3196	0.3455	0.3669	0.4417	0.3838
N.N.W.	0.4157	0.3353	0.3136	0.2870	0.2762	0.2810	0.2939	0.3110	0.3551	0.3829	0.3940	0.3870
N.W. by N.	0.3987	0.3403	0.3143	0.2850	0.2708	0.2780	0.2830	0.2840	0.3467	0.3876	0.4237	0.4090
N.W.	0.4010	0.3530	0.2996	0.2815	0.2614	0.2770	0.2798	0.3040	0.3280	0.3672	0.4076	0.4308
N.W. by W.	0.4268	0.3255	0.2927	0.2815	0.2623	0.2754	0.2759	0.2990	0.3709	0.3924	0.3978	0.4010
W.N.W.	0.4252	0.3300	0.2948	0.2890	0.2704	0.2606	0.2762	0.3140	0.3407	0.3575	0.4075	0.4142
W. by N.	0.3844	0.3360	0.2838	0.2790	0.2737	0.2620	0.2830	0.3087	0.3395	0.3744	0.3772	0.3583
W.	0.3812	0.3333	0.3142	0.3050	0.2778	0.2761	0.2865	0.3024	0.3260	0.3560	0.3817	0.3970
W. by S.	0.3740	0.3450	0.3065	0.3114	0.2833	0.2860	0.2847	0.3092	0.3386	0.3397	0.4109	0.4015
W.S.W.	0.3937	0.3544	0.3017	0.3159	0.2821	0.2890	0.2947	0.3190	0.3492	0.3680	0.4126	0.4124
S.W. by W.	0.4161	0.3600	0.3157	0.3063	0.2880	0.2903	0.3025	0.3270	0.3566	0.3610	0.4276	0.4536
S.W.	0.4269	0.3580	0.3302	0.3220	0.2877	0.2909	0.3033	0.3238	0.3600	0.3814	0.4372	0.4280
S.W. by S.	0.4080	0.3730	0.3345	0.3078	0.2903	0.2840	0.2987	0.3340	0.3360	0.3867	0.4336	0.4015
S.S.W.	0.4112	0.3790	0.3190	0.3003	0.2785	0.2790	0.2861	0.3260	0.3450	0.3829	0.4137	0.4320
S. by W.	0.4181	0.3708	0.3370	0.3050	0.2912	0.2840	0.2888	0.3220	0.3520	0.3928	0.4270	0.4346

15. HOURLY VARIATION IN POSITIVE ATMOSPHERIC ELECTRICITY.

HOUR.	1859.										1860.		1860.										1861.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
Midnight	parts. 3.02	parts. 3.04	parts. 2.30	parts. 2.85	parts. 4.17	parts. 3.20	parts. 4.35	parts. 3.99	parts. 2.28	parts. 3.02	parts. 2.75	parts. 2.68	parts. 2.38	parts. 2.32	parts. 2.25	parts. 3.87	parts. 4.74	parts. 4.16	parts. 3.15	parts. 2.73	parts. 2.40	parts. 1.90	parts. 1.66	parts. 1.22
1 ^h A M	2.89	2.57	2.65	2.90	3.87	2.94	4.02	4.04	2.26	2.70	2.09	2.40	2.14	1.77	1.79	3.35	5.13	3.71	2.79	2.42	1.78	1.69	1.90	0.93
2	2.52	2.58	2.14	2.19	3.66	2.66	3.13	3.73	2.12	2.86	1.88	1.96	2.21	2.02	1.66	2.99	4.32	3.22	3.02	2.13	1.86	1.46	1.62	0.83
3	2.55	2.51	2.27	2.43	3.08	2.26	4.09	3.95	2.43	2.62	2.02	2.12	2.33	2.20	1.84	2.77	4.77	3.10	2.93	2.80	1.97	1.45	1.91	0.87
4	2.77	2.60	2.80	2.64	3.52	2.27	3.79	3.71	2.08	2.76	1.98	2.11	2.47	2.17	1.73	2.79	4.59	3.24	3.05	2.56	1.87	1.73	1.97	0.95
5	2.53	2.72	2.64	2.58	4.05	2.49	3.87	3.37	2.45	3.14	1.97	2.43	2.36	1.99	1.76	2.85	4.53	3.82	3.10	2.93	2.38	2.09	2.58	0.82
6	3.01	3.16	3.06	3.03	4.16	3.17	4.77	4.88	3.07	3.50	3.21	3.04	3.04	2.29	2.24	3.27	4.99	4.54	4.09	3.42	3.12	2.64	3.06	1.07
7	3.77	4.22	3.32	3.89	4.98	4.38	6.45	5.16	3.13	3.95	3.50	3.66	3.72	3.59	3.34	4.55	6.05	6.63	5.30	4.61	3.11	2.87	3.10	3.04
8	3.76	4.72	4.50	5.18	5.88	5.49	5.84	5.04	2.56	3.19	3.00	2.73	3.36	4.10	4.48	5.65	7.23	6.92	5.28	4.61	2.68	1.87	2.56	2.99
9	2.97	3.91	3.98	4.84	5.56	3.66	4.74	3.42	1.77	2.54	1.87	1.93	1.80	3.14	3.24	5.71	7.23	5.56	3.97	2.87	2.46	1.69	2.80	1.30
10	2.44	2.66	2.97	4.78	5.47	3.25	4.60	2.61	1.43	2.29	1.19	1.29	1.78	2.33	2.73	4.46	7.03	4.49	3.04	2.22	2.36	0.89	2.10	1.08
11	1.64	2.16	2.76	4.08	4.61	3.07	3.55	2.40	2.23	1.95	1.51	0.84	1.68	2.00	2.04	3.77	5.70	3.27	3.08	1.81	1.68	0.86	1.99	0.87
Noon	1.88	2.32	2.63	4.01	3.88	2.60	2.96	3.03	1.71	2.55	1.38	1.12	1.53	1.83	1.80	3.27	5.14	3.06	2.84	1.50	1.63	1.07	1.81	0.84
1 ^h P M	1.71	2.14	2.48	3.57	3.40	2.66	2.50	2.11	1.15	1.76	1.53	1.17	1.43	2.02	1.97	3.17	4.56	2.84	1.95	1.24	1.38	0.93	1.60	0.93
2	1.57	2.08	2.23	2.99	3.16	2.08	4.30	2.20	1.88	2.10	1.75	0.78	1.02	1.26	2.19	2.53	4.49	2.77	1.47	1.57	1.35	0.79	1.43	0.88
3	1.12	1.76	2.79	3.37	3.18	2.64	2.08	1.55	1.26	2.00	1.37	0.72	1.26	1.72	2.14	2.62	3.96	3.15	2.33	1.20	0.70	1.19	1.01	0.42
4	2.01	2.07	3.15	3.66	3.49	3.41	3.28	2.28	1.83	2.20	2.01	0.65	1.66	2.05	2.25	3.19	4.78	3.24	2.26	1.52	1.66	1.45	1.35	1.13
5	2.29	3.06	3.81	3.92	3.76	4.27	3.61	3.53	2.33	1.76	1.85	2.00	2.20	2.49	2.64	3.68	5.29	4.47	2.70	1.66	1.56	1.33	1.47	0.82
6	2.40	3.59	4.17	4.96	5.01	4.99	4.68	3.34	2.51	2.28	1.89	1.52	2.55	2.29	3.21	4.55	5.78	5.18	3.48	2.52	1.64	1.87	1.86	0.82
7	3.57	3.90	3.59	3.86	5.29	4.93	4.72	4.88	3.39	2.90	2.32	2.29	3.16	3.53	2.76	4.81	6.77	5.90	4.40	3.17	2.71	2.46	2.69	0.91
8	3.39	3.67	3.51	4.07	5.39	4.49	5.28	5.03	3.69	3.59	2.57	2.45	3.51	2.96	3.75	4.90	5.94	5.72	4.73	3.78	2.63	2.13	2.33	1.57
9	3.49	3.53	3.13	3.97	4.79	4.62	5.74	4.30	4.27	3.75	3.23	3.15	3.60	3.28	2.69	5.08	6.01	5.00	4.70	3.26	3.52	2.26	3.06	1.63
10	3.83	3.67	3.25	3.79	4.40	4.86	4.98	4.74	4.43	3.79	3.02	2.92	3.20	3.36	2.78	4.45	5.66	4.99	4.21	3.13	3.69	2.65	2.45	1.51
11	3.48	3.06	2.76	3.13	4.32	4.27	4.21	4.34	3.50	3.45	2.25	2.95	3.53	2.40	2.68	4.08	6.02	4.71	3.98	3.15	3.57	2.63	2.22	1.29

HOUR.	1861.										1862.		1862.										1863.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
Midnight	parts. 1.20	parts. 1.79	parts. 2.30	parts. 3.32	parts. —	parts. 3.91	parts. 4.24	parts. 4.23	parts. 3.68	parts. 2.49	parts. 3.86	parts. 4.24	parts. 2.45	parts. 2.66	parts. 3.37	parts. 3.06	parts. 1.16	parts. 2.32	parts. —	parts. —	parts. —	parts. —	parts. —	parts. —
1 ^h A M	1.09	1.60	2.09	2.77	—	3.08	3.96	3.53	3.56	2.32	4.01	4.08	2.24	2.22	2.67	3.10	1.23	2.09	—	—	—	—	—	—
2	0.97	1.38	1.63	2.33	—	2.99	3.40	3.22	2.94	2.23	3.52	3.76	2.45	1.68	3.06	3.01	1.08	2.07	—	—	—	—	—	—
3	0.98	1.37	1.74	2.30	—	3.12	3.27	3.08	2.93	2.34	3.49	3.49	2.52	1.94	2.70	2.85	1.09	2.02	—	—	—	—	—	—
4	1.01	1.59	1.92	2.69	—	2.61	3.21	2.94	3.06	2.23	3.15	3.65	2.74	1.62	2.72	2.82	1.34	2.11	—	—	—	—	—	—
5	1.22	1.48	1.92	2.58	—	3.40	3.42	3.29	3.57	2.59	3.23	3.46	2.26	1.93	2.55	2.59	1.27	2.10	—	—	—	—	—	—
6	1.49	2.08	2.15	2.91	—	4.23	4.45	3.71	4.73	3.42	4.53	3.88	3.50	3.24	3.04	3.23	1.47	3.16	—	—	—	—	—	—
7	2.23	3.68	2.72	3.90	—	5.13	6.28	4.23	4.48	3.80	4.59	4.37	3.66	4.13	4.15	3.85	2.32	3.72	—	—	—	—	—	—
8	2.80	4.56	4.26	5.50	—	6.64	5.51	4.23	4.58	3.95	4.97	4.10	3.42	4.31	4.77	4.32	3.62	4.21	—	—	—	—	—	—
9	1.42	3.24	3.23	5.17	—	6.12	3.32	2.16	2.84	2.18	3.11	2.83	2.54	3.03	4.22	4.50	4.04	4.16	—	—	—	—	—	—
10	1.13	2.06	2.54	4.20	—	4.63	3.03	1.38	2.05	1.68	2.61	2.10	1.77	2.27	3.96	4.82	3.10	3.20	—	—	—	—	—	—
11	0.35	1.69	1.65	3.73	—	3.76	2.50	1.85	1.76	1.94	2.76	1.51	1.69	2.34	3.82	4.48	2.27	3.05	—	—	—	—	—	—
Noon	0.79	1.07	2.09	3.36	—	3.07	2.15	1.79	1.97	1.51	2.17	1.50	1.68	1.62	3.20	3.84	1.73	2.51	—	—	—	—	—	—
1 ^h P M	0.78	1.14	1.45	2.93	—	2.53	1.68	1.62	1.44	1.07	2.15	1.14	0.99	1.75	2.59	3.43	1.68	1.84	—	—	—	—	—	—
2	0.77	0.94	1.47	2.73	—	3.13	2.16	1.54	2.22	1.70	2.29	1.49	1.34	1.57	2.53	2.94	1.31	1.64	—	—	—	—	—	—
3	0.51	0.78	1.35	2.58	—	3.11	2.05	1.53	1.60	1.24	2.02	1.47	1.68	2.46	2.56	2.91	1.89	1.48	—	—	—	—	—	—
4	0.70	0.83	1.78	3.29	—	3.08	2.11	2.32	1.60	1.59	2.31	1.37	2.01	2.52	3.12	3.48	2.00	2.62	—	—	—	—	—	—
5	1.12	1.57	2.18	4.20	—	4.22	3.25	2.04	2.07	2.21	2.94	0.99	1.28	2.78	3.72	3.75	2.63	2.96	—	—	—	—	—	—
6	1.36	2.48	2.74	4.59	—	5.37	3.25	3.21	3.34	2.28	2.87	1.52	1.92	2.58	3.90	4.95	3.06	3.34	—	—	—	—	—	—
7	1.77	2.52	2.75	4.09	—	6.46	4.85	3.47	2.92	2.78	3.13	2.05	2.88	3.08	3.56	4.33	2.50	4.28	—	—	—	—	—	—
8	1.75	2.90	3.10	3.73	—	5.93	5.10	3.83	4.33	3.25	3.81	3.42	3.31	3.22	3.63	4.18	2.28	4.38	—	—	—	—	—	—
9	1.73	2.22	2.74	3.23	—	5.38	4.49	3.90	4.18	3.22	3.63	3.71	3.54	3.18	4.44	3.33	2.24	4.09	—	—	—	—	—	—
10	1.66	2.08	2.64	3.35	—	4.95	4.68	4.23	4.79	3.12	3.44	4.70	2.91	3.68	4.45	3.65	2.22	3.98	—	—	—	—	—	—
11	1.50	2.29	2.39	3.08	—	4.69	4.52	4.23	3.96	3.02	4.28	4.13	2.87	2.98	3.82	3.43	1.64	3.22	—	—	—	—	—	—

16. MONTHLY MEANS OF POSITIVE ELECTRICITY FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1859.										1860.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December	January.	February.
	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.
S.	2.75	2.89	5.21	5.31	5.04	4.42	3.74	3.81	2.19	2.51	1.64	1.54
S. by E.	3.53	3.53	—	—	4.05	5.27	5.20	2.93	2.76	3.16	1.62	2.49
S.S.E.	4.32	6.22	—	7.03	5.40	6.20	4.83	5.22	3.69	3.32	2.78	2.53
S.E. by S.	3.96	4.73	4.03	5.03	—	6.29	6.32	3.36	4.54	3.21	1.75	2.90
S.E.	3.99	5.10	6.02	6.03	9.38	7.15	5.31	5.91	3.78	3.58	3.11	2.89
S.E. by E.	2.06	5.02	—	6.22	—	1.10	4.70	2.52	4.98	3.98	2.25	2.49
E.S.E.	4.22	4.76	—	5.23	6.26	8.95	4.13	6.62	5.08	3.45	2.21	2.40
E. by S.	2.58	7.39	—	4.10	7.80	4.05	3.62	8.68	—	2.55	2.68	2.16
E.	3.17	4.57	5.51	5.95	8.05	6.93	6.08	5.26	3.30	3.47	3.13	1.15
E. by N.	2.20	4.36	—	6.10	5.62	5.57	5.01	0.17	1.37	3.12	2.21	1.76
E.N.E.	2.18	4.21	4.05	5.54	5.18	4.54	5.47	3.72	5.17	3.21	1.71	0.69
N.E. by E.	2.48	4.65	3.76	6.13	7.49	5.64	5.55	2.98	3.82	3.00	3.09	2.67
N.E.	2.82	3.73	3.78	5.28	6.55	5.44	5.60	4.29	2.70	2.98	2.87	2.02
N.E. by N.	2.41	3.08	2.99	3.71	4.80	4.22	4.74	3.84	1.89	3.01	0.81	0.34
N.N.E.	2.70	2.62	2.65	4.04	3.09	3.33	4.74	4.33	2.09	3.26	1.33	1.74
N. by E.	2.15	2.04	2.80	3.21	3.02	3.17	3.56	3.37	0.73	2.55	0.83	1.48
N.	1.67	2.27	3.20	2.75	2.70	2.74	3.10	3.12	1.41	2.28	1.30	1.24
N. by W.	2.43	1.87	2.94	2.54	2.70	2.77	4.48	3.24	1.37	2.40	1.39	0.90
N.N.W.	1.86	2.23	3.36	3.27	4.07	3.81	4.29	3.16	1.37	2.64	1.74	0.84
N.W. by N.	2.85	1.90	3.15	3.11	4.40	4.22	4.43	3.04	0.92	—	0.97	1.37
N.W.	2.64	2.63	2.78	2.19	3.18	3.09	3.63	3.81	1.59	2.99	1.47	1.42
N.W. by W.	2.28	2.27	2.52	1.70	3.24	4.66	4.99	3.41	3.24	2.39	1.75	4.28
W.N.W.	1.71	2.00	2.55	2.32	3.30	3.30	2.89	3.16	1.92	4.05	1.21	1.96
W. by N.	2.29	1.82	2.56	2.05	2.82	2.93	3.97	3.67	1.76	1.00	1.17	0.57
W.	2.00	2.29	2.42	2.50	2.34	2.86	3.15	2.97	1.85	2.13	1.23	1.53
W. by S.	2.14	2.04	2.32	1.51	2.00	3.56	2.62	3.08	2.19	2.58	1.81	1.72
W.S.W.	2.50	2.60	2.46	1.84	2.32	3.89	3.12	2.86	1.99	2.06	2.28	2.47
S.W. by W.	2.58	2.82	3.18	3.58	2.75	3.54	2.54	4.29	3.44	2.82	2.22	2.48
S.W.	2.50	3.23	3.22	4.63	3.25	4.87	3.40	3.15	2.97	3.25	2.76	2.49
S.W. by S.	2.70	2.53	4.54	4.24	3.29	5.94	4.70	2.77	2.91	1.84	1.41	1.47
S.S.W.	2.64	3.35	4.90	4.55	5.67	3.93	3.53	3.99	2.62	2.41	2.76	1.95
S. by W.	2.17	2.85	7.27	4.36	3.88	4.85	4.17	3.82	2.22	3.29	2.14	1.56

16. MONTHLY MEANS OF POSITIVE ELECTRICITY FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1860.										1861.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December	January.	February.
S.	parts. 1.98	parts. 1.78	parts. 2.87	parts. 4.91	parts. 7.14	parts. 4.78	parts. 3.92	parts. 2.46	parts. 1.59	parts. 1.70	parts. 2.15	parts. 0.80
S. by E.	2.62	1.81	3.46	4.58	6.22	3.98	2.75	2.26	2.05	1.78	1.77	0.98
S.S.E.	2.47	2.38	5.47	4.24	5.66	5.54	4.29	3.97	2.18	2.85	2.86	1.01
S.E. by S.	3.52	3.21	9.44	4.89	4.82	3.96	5.76	5.17	2.64	2.54	2.46	1.92
S.E.	3.12	2.11	4.10	5.22	5.47	4.74	5.70	3.66	3.05	2.48	3.50	1.14
S.E. by E.	3.42	5.16	7.19	3.77	6.00	4.08	3.18	5.30	2.90	3.13	2.84	0.54
E.S.E.	3.42	2.75	—	5.08	5.56	6.78	5.46	4.24	2.14	2.70	2.59	1.93
E. by S.	0.50	1.42	5.02	4.68	7.73	7.64	7.69	2.49	3.07	2.96	4.53	0.88
E.	2.59	3.23	7.69	5.41	6.69	6.02	6.78	6.11	2.84	1.15	3.08	1.62
E. by N.	1.22	3.85	4.17	5.25	7.72	—	5.11	3.93	3.96	1.74	3.44	2.87
E.N.E.	2.65	4.12	5.95	6.49	8.11	6.58	6.34	4.92	2.61	1.14	3.28	1.85
N.E. by E.	3.84	3.35	5.04	6.24	4.83	5.58	5.19	3.04	2.74	2.85	3.12	1.97
N.E.	3.51	3.03	3.88	5.01	6.19	6.11	4.09	3.27	2.41	1.97	2.08	3.12
N.E. by N.	3.26	2.21	0.72	2.68	7.18	4.40	1.56	3.71	0.50	1.31	1.20	2.50
N.N.E.	2.01	1.97	2.12	2.50	5.26	2.31	2.71	2.21	2.93	1.13	1.25	1.27
N. by E.	2.35	2.59	2.32	2.33	4.39	4.21	3.53	1.86	0.25	1.15	1.32	1.36
N.	2.68	2.30	2.71	2.28	3.09	3.68	3.31	1.90	3.15	1.15	2.53	1.42
N. by W.	2.22	2.58	1.76	2.21	5.33	4.45	3.45	2.25	6.11	1.33	1.65	1.13
N.N.W.	2.97	1.95	1.70	3.04	4.33	4.84	4.29	3.10	2.96	0.92	0.95	0.73
N.W. by N.	1.71	2.55	2.31	4.11	3.14	3.29	4.36	4.01	2.77	1.45	2.69	1.55
N.W.	2.49	2.62	2.31	3.72	3.96	3.41	2.99	2.76	2.49	1.59	3.03	1.11
N.W. by W.	2.37	2.26	2.27	3.85	2.25	4.34	1.34	2.11	2.21	2.22	2.99	0.83
W.N.W.	1.53	2.48	2.31	2.28	3.63	2.25	2.34	2.48	3.31	1.91	1.61	0.97
W. by N.	2.82	2.58	2.53	5.05	3.46	1.44	3.84	2.52	1.52	1.74	2.14	1.51
W.	1.55	1.57	1.87	2.13	3.27	2.92	2.11	2.35	1.60	1.88	1.91	1.33
W. by S.	1.13	2.47	2.09	2.23	2.10	1.84	0.95	1.65	1.14	1.81	3.69	1.23
W.S.W.	2.16	1.81	2.40	2.79	2.90	3.64	2.52	1.56	1.99	2.74	2.55	1.15
S.W. by W.	2.24	2.52	1.82	3.93	4.60	4.20	2.89	2.28	1.88	2.28	3.39	1.57
S.W.	2.14	3.37	3.44	4.52	5.35	4.65	3.69	1.88	2.20	2.22	2.69	2.01
S.W. by S.	2.37	1.96	4.54	5.29	3.82	3.69	2.36	2.27	2.11	2.09	3.09	2.34
S.S.W.	1.60	2.90	3.60	4.80	7.03	5.66	2.71	1.58	2.39	1.73	1.83	0.93
S. by W.	2.00	1.91	4.28	5.22	5.34	4.69	2.61	2.22	1.66	1.14	1.73	0.66

16. MONTHLY MEANS OF POSITIVE ELECTRICITY FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1861.										1862.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.
S.	1.38	1.33	2.22	5.65	4.58	4.24	2.56	3.00	3.13	2.16	2.72	1.97
S. by E.	1.33	1.53	2.91	6.00	5.57	4.86	3.49	3.82	3.66	2.78	3.70	2.69
S.S.E.	2.60	2.47	2.68	6.44	6.43	5.28	3.91	4.06	3.74	2.95	3.08	2.76
S.E. by S.	2.03	2.41	2.89	—	5.90	5.39	3.03	3.33	4.89	2.92	4.69	1.64
S.E.	1.97	2.70	4.26	7.54	4.57	6.40	4.46	5.99	4.63	3.35	3.86	4.05
S.E. by E.	1.00	2.28	2.32	—	6.52	5.90	6.59	—	4.03	3.59	4.76	3.57
E.S.E.	1.90	2.50	1.71	7.27	—	5.47	4.74	5.04	4.75	4.63	3.20	3.15
E. by S.	2.29	2.44	—	8.91	7.90	6.11	6.51	—	5.25	3.90	—	3.96
E.	1.70	1.69	4.66	5.77	7.75	7.40	4.60	5.49	4.70	3.74	4.45	4.87
E. by N.	0.86	1.26	2.36	6.15	6.57	4.29	9.27	4.33	4.55	1.78	2.13	4.35
E.N.E.	1.30	1.95	2.82	5.82	7.28	5.78	5.37	4.61	4.21	2.15	3.57	5.56
N.E. by E.	2.57	2.02	2.19	5.78	4.76	5.59	4.20	3.91	3.62	3.88	4.41	4.77
N.E.	1.41	2.47	2.88	4.47	6.48	5.06	4.24	3.86	2.92	2.50	3.35	4.27
N.E. by N.	0.59	1.79	2.19	2.73	4.07	3.68	3.30	2.09	1.82	2.22	2.92	—
N.N.E.	1.05	1.90	1.95	2.99	3.47	3.38	2.91	3.53	2.82	1.82	3.93	5.72
N. by E.	1.24	2.60	1.81	2.33	2.62	4.06	3.83	2.38	3.34	1.80	3.81	5.06
N.	0.72	1.20	1.21	2.53	2.10	3.32	2.72	2.66	2.16	1.93	4.97	3.05
N. by W.	0.44	0.83	2.33	2.70	2.33	4.14	2.20	2.59	1.82	1.86	2.55	2.74
N.N.W.	1.23	1.31	2.41	3.27	3.73	3.91	3.54	2.39	2.64	3.22	2.85	5.25
N.W. by N.	0.50	1.85	2.42	3.63	0.76	4.38	3.42	2.07	1.38	1.79	4.23	3.64
N.W.	0.94	1.83	2.26	3.43	2.12	4.40	3.71	2.51	2.54	2.16	2.75	3.04
N.W. by W.	0.25	1.99	1.64	2.62	1.58	3.38	4.69	4.08	1.87	0.96	3.97	—
W.N.W.	1.15	0.93	2.07	4.07	2.36	3.38	3.47	3.54	3.17	1.44	3.96	2.99
W. by N.	0.25	1.86	2.16	3.20	3.01	2.43	3.87	2.23	3.07	2.03	4.43	3.68
W.	1.54	1.63	2.16	2.96	2.09	3.11	3.74	3.57	2.66	1.81	3.79	3.41
W. by S.	1.22	0.84	2.32	4.00	2.52	3.56	3.34	3.33	3.49	3.15	4.40	3.86
W.S.W.	0.77	1.54	1.91	3.38	2.08	3.04	2.89	3.13	2.83	1.96	3.51	3.66
S.W. by W.	1.45	—	2.54	—	2.77	2.21	4.15	3.47	3.66	2.90	2.28	3.36
S.W.	1.20	1.49	1.90	0.82	2.20	3.78	4.79	4.17	3.10	2.58	3.63	2.34
S.W. by S.	6.98	1.57	2.25	4.03	5.33	5.03	2.96	4.85	4.06	3.67	2.27	2.36
S.S.W.	7.13	1.25	1.69	7.79	6.19	4.26	3.44	3.11	3.31	2.53	3.28	2.01
S. by W.	0.76	1.71	2.62	6.05	4.93	4.86	3.87	2.12	3.03	2.30	2.85	1.86

16. MONTHLY MEANS OF POSITIVE ELECTRICITY FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	1862.										1863.	
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	parts.	parts.	parts.	parts.	parts.	parts.	parts.					
S.	1.81	2.06	5.01	3.64	4.02	2.92	4.01	—	—	—	—	—
S. by E.	2.45	2.69	6.51	4.42	0.50	6.46	4.47	—	—	—	—	—
S.S.E.	2.22	2.40	6.25	4.77	6.89	4.89	2.06	—	—	—	—	—
S.E. by S.	3.70	—	6.78	5.43	—	8.73	5.91	—	—	—	—	—
S.E.	2.41	3.14	7.71	5.04	—	1.74	4.50	—	—	—	—	—
S.E. by E.	4.54	3.55	6.18	4.70	—	—	8.00	—	—	—	—	—
E.S.E.	2.94	2.31	6.98	6.62	—	8.76	5.17	—	—	—	—	—
E. by S.	2.68	3.91	4.81	—	—	0.50	—	—	—	—	—	—
E.	2.59	3.86	6.74	5.92	—	6.95	—	—	—	—	—	—
E. by N.	2.79	4.51	3.97	5.67	—	4.44	2.73	—	—	—	—	—
E.N.E.	3.74	3.49	5.32	5.99	—	4.52	4.00	—	—	—	—	—
N.E. by E.	3.42	4.24	7.73	5.86	0.50	7.17	2.45	—	—	—	—	—
N.E.	3.33	3.65	4.23	5.15	2.55	3.28	2.68	—	—	—	—	—
N.E. by N.	2.25	2.46	4.27	3.09	3.60	2.67	2.39	—	—	—	—	—
N.N.E.	2.86	2.52	2.71	3.29	1.53	2.91	1.35	—	—	—	—	—
N. by E.	2.17	1.82	2.83	2.13	1.71	2.10	2.14	—	—	—	—	—
N.	1.89	1.61	2.80	1.88	1.44	2.24	2.21	—	—	—	—	—
N. by W.	2.47	1.70	3.57	2.28	2.56	1.71	2.05	—	—	—	—	—
N.N.W.	1.84	4.25	3.26	2.39	2.43	2.98	2.11	—	—	—	—	—
N.W. by N.	0.50	3.28	3.17	2.91	2.78	4.72	1.81	—	—	—	—	—
N.W.	2.25	4.16	3.72	3.10	1.74	2.69	1.97	—	—	—	—	—
N.W. by W.	2.21	3.67	3.97	5.33	2.87	3.11	1.94	—	—	—	—	—
W.N.W.	1.78	2.27	2.98	3.40	2.62	2.68	3.34	—	—	—	—	—
W. by N.	1.16	2.48	3.58	3.83	1.45	2.71	1.25	—	—	—	—	—
W.	1.46	2.93	4.27	3.35	1.59	2.88	1.66	—	—	—	—	—
W. by S.	1.78	2.50	3.89	1.93	2.88	3.52	1.18	—	—	—	—	—
W.S.W.	2.04	1.63	4.32	3.46	3.20	2.63	2.14	—	—	—	—	—
S.W. by W.	1.61	2.53	6.95	3.87	4.71	3.54	4.65	—	—	—	—	—
S.W.	2.41	2.48	3.08	5.29	3.17	3.38	2.84	—	—	—	—	—
S.W. by S.	2.65	1.86	6.52	6.46	7.02	3.52	2.17	—	—	—	—	—
S.S.W.	2.18	2.41	4.39	4.89	5.80	3.31	4.05	—	—	—	—	—
S. by W.	1.61	2.57	4.55	2.75	3.11	2.98	2.30	—	—	—	—	—

16. MEAN MONTHLY MEANS OF POSITIVE ELECTRICITY FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	During the years 1858 to 1862.											
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.	parts.
S.	2.04	1.90	3.24	4.39	5.10	3.80	3.22	2.82	1.86	2.29	2.28	1.81
S. by E.	2.42	2.38	3.70	4.76	4.74	4.86	3.94	2.26	2.31	2.80	2.65	2.35
S.S.E.	2.71	3.15	3.93	4.99	5.28	5.12	3.93	4.11	2.60	3.18	3.13	2.41
S.E. by S.	3.07	3.08	2.65	4.87	5.04	5.81	5.25	3.98	3.42	3.01	3.03	2.53
S.E.	2.96	3.28	3.17	5.05	5.50	5.28	4.78	4.78	3.58	3.46	3.50	2.99
S.E. by E.	2.52	3.31	3.22	4.23	5.72	4.08	4.51	5.11	3.64	3.86	3.20	2.11
E.S.E.	3.08	3.52	3.76	4.96	5.89	6.93	4.85	5.36	3.90	3.85	2.88	2.83
E. by S.	2.44	3.15	3.20	4.54	7.70	6.33	4.17	5.80	3.73	3.20	3.74	2.58
E.	2.66	3.28	3.44	5.32	6.85	6.27	6.23	5.53	3.83	3.31	3.30	3.41
E. by N.	1.87	2.58	5.46	4.83	6.66	4.74	5.25	3.34	4.04	3.06	2.82	3.21
E.N.E.	2.82	3.11	3.92	5.60	6.37	5.10	6.62	4.33	3.80	2.70	2.78	3.52
N.E. by E.	2.70	3.22	3.01	5.86	5.54	5.17	4.69	3.45	3.30	3.10	3.45	3.01
N.E.	2.67	3.30	3.34	4.82	5.63	4.79	3.90	3.73	2.73	2.74	2.67	2.63
N.E. by N.	1.92	2.47	2.31	3.23	4.97	3.47	2.91	3.25	1.60	2.27	1.62	2.43
N.N.E.	2.00	2.28	2.23	3.07	2.83	3.00	2.46	3.30	2.41	2.39	1.92	2.68
N. by E.	1.87	2.31	2.38	2.53	2.64	3.08	3.30	2.59	1.51	1.72	1.60	1.56
N.	1.85	2.06	2.42	2.25	2.15	2.69	2.77	2.75	1.81	1.98	2.62	2.04
N. by W.	1.50	2.07	2.31	2.46	3.19	2.93	2.96	3.18	1.80	1.83	1.77	1.69
N.N.W.	2.11	2.39	3.14	3.01	3.03	3.50	3.48	3.01	2.05	2.38	2.13	2.12
N.W. by N.	1.68	2.35	2.66	3.51	2.83	3.33	2.83	3.01	1.90	2.71	2.46	1.68
N.W.	2.16	2.55	3.01	3.05	2.73	3.03	2.75	3.12	2.13	2.38	2.40	2.06
N.W. by W.	2.15	2.39	2.30	2.67	2.25	3.13	2.26	3.57	2.04	3.02	2.41	1.94
W.N.W.	1.59	2.22	2.30	3.19	2.96	2.78	2.05	3.20	2.77	2.35	1.93	1.73
W. by N.	1.77	2.63	2.56	3.18	2.78	2.66	2.79	3.08	1.90	1.74	2.03	2.02
W.	1.64	2.28	2.35	2.69	2.27	2.77	3.14	2.97	1.98	2.26	2.30	2.31
W. by S.	1.76	1.96	2.39	1.96	2.44	3.03	2.28	2.69	2.24	3.08	2.54	2.42
W.S.W.	1.82	2.17	2.70	2.21	2.68	2.90	2.35	2.59	2.11	2.47	2.55	2.76
S.W. by W.	2.08	2.76	2.47	3.16	3.03	2.90	2.74	3.01	2.53	3.05	2.83	2.93
S. W.	2.03	2.59	2.71	4.09	3.68	3.71	3.42	2.80	2.64	2.90	2.91	2.61
S.W. by S.	2.04	2.35	3.51	4.82	3.95	4.89	2.97	2.87	2.61	2.52	1.73	2.47
S.S.W.	1.94	2.17	3.11	4.65	5.90	4.31	3.70	2.47	2.59	2.28	2.61	1.79
S. by W.	1.74	2.02	3.77	4.14	4.69	4.17	3.58	2.58	2.13	2.17	2.28	1.76

17. HOURLY VARIATION IN AMOUNT OF CLOUD.

HOUR.	1859										1860		1860										1861	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	c.	Nov.	Dec.	Jan.	Febr.
Midnight	(0-10) 5.83	(0-10) 5.48	(0-10) 5.78	(0-10) 6.15	(0-10) 5.89	(0-10) 6.97	(0-10) 4.40	(0-10) 4.85	(0-10) 6.35	(0-10) 4.82	(0-10) 4.90	(0-10) 4.67	(0-10) 5.02	(0-10) 4.14	(0-10) 6.51	(0-10) 6.01	(0-10) 4.52	(0-10) 6.10	(0-10) 5.32	(0-10) 7.17	(0-10) 5.97	(0-10) 4.88	(0-10) 5.89	(0-10) 5.47
1 ^h AM	5.57	6.27	6.12	6.27	5.37	6.92	5.42	5.37	6.62	4.67	4.37	4.92	5.52	5.14	6.18	5.60	5.36	6.18	5.82	6.93	6.11	4.73	6.02	5.36
2	6.13	6.08	6.45	6.36	5.27	6.88	5.23	5.97	6.71	4.42	4.14	5.36	5.41	5.32	5.65	5.35	5.19	6.23	5.60	7.05	6.21	5.07	6.02	5.45
3	5.85	6.20	6.33	6.40	5.92	6.50	4.78	6.03	6.83	4.10	4.22	5.15	5.94	5.30	6.25	5.54	5.15	6.22	5.19	7.47	5.94	5.83	5.50	5.63
4	6.03	5.97	5.80	6.64	6.28	6.99	5.24	6.73	6.75	4.74	4.63	5.03	5.47	6.02	6.88	5.63	6.03	6.45	4.80	7.48	6.30	5.85	5.71	6.55
5	6.60	6.42	6.13	7.20	5.82	6.93	5.47	5.95	6.28	4.70	5.00	5.48	5.63	6.00	7.13	5.23	5.50	6.50	4.45	7.65	6.40	5.59	6.44	6.61
6	6.72	7.00	6.80	7.39	5.77	6.76	5.51	6.07	6.38	4.80	5.94	6.02	5.71	6.00	7.00	5.24	5.84	6.50	4.70	7.87	6.41	5.61	6.62	6.58
7	6.48	7.27	7.41	8.03	7.03	6.98	4.76	6.40	6.68	4.73	5.50	6.28	5.59	6.83	7.38	7.38	6.10	6.37	5.84	8.40	7.00	5.59	6.25	6.45
8	6.57	6.90	7.30	8.03	7.04	6.98	5.08	6.99	7.31	4.97	5.75	5.87	5.24	6.55	6.93	6.67	6.14	6.58	5.73	7.95	7.31	5.30	6.02	5.73
9	6.37	7.07	7.30	8.05	5.75	6.95	5.37	6.70	6.98	5.45	5.97	6.52	5.11	6.61	6.33	6.24	5.66	6.93	.81	7.17	7.23	5.67	5.94	5.63
10	6.18	6.72	7.03	7.74	5.47	6.77	5.68	6.32	6.75	5.28	5.72	5.96	4.48	6.25	6.35	6.32	5.72	6.47	.98	7.20	6.42	5.26	6.05	5.59
11	5.77	6.95	7.34	7.64	6.10	6.65	5.57	6.15	6.00	5.42	5.43	5.94	4.17	6.83	6.45	6.46	5.66	5.52	6.24	7.54	6.27	5.21	6.05	5.79
Noon	5.98	7.27	7.40	7.55	5.86	6.53	5.53	6.27	5.15	5.55	5.40	5.89	3.86	6.32	7.33	6.58	5.60	5.24	5.97	7.07	5.76	5.09	5.95	5.54
1 ^h PM	5.20	6.80	7.08	7.71	5.53	6.13	5.35	5.83	4.55	5.50	5.22	5.63	3.85	6.65	6.95	6.80	5.76	5.36	6.03	7.09	5.99	5.14	6.31	6.15
2	4.77	7.17	7.23	7.09	5.42	6.02	5.69	5.85	4.85	5.53	5.04	5.44	4.37	6.57	6.82	6.66	5.34	5.18	6.13	7.05	5.77	5.39	6.07	6.04
3	4.13	7.07	6.58	6.76	5.35	6.42	5.54	5.68	4.63	5.62	4.72	5.07	4.19	6.09	6.90	7.36	5.72	5.27	6.12	6.30	5.59	4.97	5.79	5.92
4	4.25	6.45	6.45	7.01	5.72	6.57	5.62	5.75	5.82	5.62	4.57	5.40	3.92	5.52	6.97	7.19	5.64	5.56	6.12	5.92	5.97	4.82	6.17	6.02
5	4.28	6.33	6.37	7.20	6.15	6.18	5.63	5.79	5.20	5.02	4.37	5.00	3.22	5.21	7.22	6.98	5.95	5.51	6.09	5.98	5.35	5.33	5.91	6.52
6	4.52	6.60	6.53	6.27	6.01	6.36	5.85	6.12	5.57	4.77	4.35	5.28	3.39	5.30	7.12	7.01	6.36	5.87	5.82	6.53	5.24	5.29	5.95	5.93
7	4.13	6.38	5.78	6.01	6.35	5.53	5.35	5.68	5.92	4.48	4.60	5.64	3.64	5.17	7.08	7.36	5.52	5.81	5.48	6.43	5.10	5.62	5.62	5.84
8	4.70	6.10	5.78	5.76	5.76	5.08	4.98	5.92	5.78	4.72	4.63	5.43	3.45	5.25	7.08	7.19	5.12	6.19	4.92	6.82	4.69	5.37	5.41	5.95
9	5.37	5.80	5.58	5.66	5.62	5.37	5.25	5.52	5.90	4.15	3.93	5.20	3.24	5.20	7.22	6.59	5.24	5.70	4.83	7.32	4.94	5.14	5.75	5.55
10	5.27	6.15	5.83	6.77	5.52	4.93	5.78	5.27	5.57	4.00	4.33	4.83	3.89	4.87	7.23	6.09	4.82	5.75	4.97	6.79	4.60	5.30	5.82	4.68
11	5.58	5.70	6.00	6.24	5.60	5.70	5.15	4.65	5.48	4.60	4.92	5.23	4.50	4.79	6.70	5.91	4.64	5.95	4.70	6.74	5.11	5.43	5.60	4.55

HOUR.	1861.										1862.		1862.										1863.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
Midnight	(0-10) 5.69	(0-10) 4.44	(0-10) 6.08	(0-10) 5.57	(0-10) 5.73	(0-10) 6.11	(0-10) 4.73	(0-10) 5.65	(0-10) 5.92	(0-10) 7.29	(0-10) 4.46	(0-10) 6.38	(0-10) 4.46	(0-10) 6.38	(0-10) 7.05	(0-10) 7.18	(0-10) 6.87	(0-10) 6.49	(0-10) 5.29	(0-10) 5.13	(0-10) 5.60	(0-10) 4.53	(0-10) 5.87	(0-10) 5.99
1 ^h AM	6.26	4.20	5.56	6.02	6.85	5.92	4.86	5.74	6.04	7.29	5.10	6.51	5.10	6.51	7.15	7.55	7.07	5.89	5.54	5.28	5.22	4.58	5.95	6.48
2	6.15	4.58	5.27	6.13	6.08	5.99	5.19	5.76	6.04	6.75	5.16	6.24	5.16	6.24	7.33	7.52	7.11	5.85	5.47	5.59	5.68	4.66	5.92	7.04
3	6.35	4.55	6.04	5.85	5.92	6.05	4.82	5.65	6.11	6.05	5.59	6.12	5.59	6.12	7.28	7.90	6.54	6.00	5.32	6.39	4.70	4.53	5.98	6.95
4	5.87	4.54	7.08	6.25	6.22	6.05	4.72	5.69	6.44	6.06	6.19	6.57	6.19	6.57	7.47	7.55	6.82	6.28	4.86	6.19	5.46	5.96	6.27	7.07
5	6.16	4.66	6.94	6.30	6.24	5.70	4.84	6.19	6.68	6.71	7.04	7.21	7.04	7.21	7.36	7.62	8.06	6.23	5.92	6.20	5.60	5.62	6.10	7.79
6	6.58	5.19	6.92	6.47	6.47	6.50	5.66	5.92	6.78	6.69	7.63	7.14	7.63	7.14	7.55	7.60	7.76	6.55	6.56	6.43	6.22	5.47	6.08	7.61
7	6.37	5.90	6.73	6.75	5.13	5.24	5.62	5.90	6.87	7.13	7.25	7.07	7.25	7.07	7.87	7.84	7.52	6.96	6.75	6.66	6.38	6.56	6.23	8.33
8	6.23	6.08	6.71	6.05	5.00	5.15	5.17	6.38	7.48	6.99	7.24	6.79	7.24	6.79	7.59	8.05	7.35	6.45	6.78	7.14	6.84	7.02	6.37	8.03
9	6.34	5.94	6.89	6.88	7.06	6.63	5.00	6.44	7.57	6.92	6.94	7.13	6.94	7.13	8.09	7.97	6.82	6.94	7.45	5.46	6.09	6.05	6.22	7.21
10	5.86	6.09	6.62	6.72	6.71	6.37	5.12	6.47	7.25	7.14	7.09	7.14	7.09	7.14	7.92	7.83	7.19	6.98	7.33	4.56	6.04	5.34	5.67	7.08
11	5.79	6.45	6.70	7.12	6.68	7.01	5.23	6.65	6.88	7.11	6.61	6.94	6.61	6.94	8.32	7.68	7.24	7.15	7.33	4.34	5.91	5.23	5.24	6.74
Noon	6.19	6.15	6.47	6.68	6.76	6.68	5.34	6.42	6.53	6.81	6.90	6.85	6.90	6.85	8.77	8.12	8.06	6.98	7.50	4.31	6.12	5.10	5.24	5.68
1 ^h PM	5.84	6.14	6.27	6.33	7.23	6.39	4.76	6.43	6.23	6.73	7.19	7.46	7.19	7.46	8.95	8.13	7.97	6.82	7.07	3.82	6.29	5.12	5.34	5.13
2	6.03	6.14	6.55	6.49	7.19	6.60	4.81	6.32	5.78	6.81	6.66	7.14	6.66	7.14	8.90	7.90	8.27	6.64	6.95	4.07	5.93	4.87	4.67	4.65
3	5.54	5.83	6.29	6.80	7.06	6.44	5.17	6.47	6.03	6.35	6.50	6.56	6.50	6.56	8.58	8.40	7.84	7.03	7.03	4.23	6.31	5.24	4.89	4.38
4	5.56	5.53	6.66	6.55	6.69	6.32	5.27	6.34	6.04	6.71	6.44	6.34	6.44	6.34	8.31	7.59	7.68	6.75	6.47	3.87	5.84	5.32	4.10	3.98
5	5.73	5.70	6.69	6.75	7.02	5.97	5.34	6.41	5.67	7.02	6.42	6.20	6.42	6.20	8.42	7.80	7.68	6.71	6.31	4.69	6.35	5.64	4.98	4.28
6	5.35	5.18	6.87	5.18	6.39	6.58	6.00	6.57	5.84	6.79	6.44	6.75	6.44	6.75	8.34	7.13	7.96	6.84	6.40	4.62	6.15	5.27	5.02	4.81
7	5.31	4.30	6.68	4.72	5.99	5.68	5.00	6.52	6.34	6.77	6.31	6.47	6.31	6.47	8.21	7.37	7.20	6.98	6.37	5.07	6.57	4.96	5.46	5.31
8	4.71	4.28	6.01	5.63	6.36	5.31	4.50	5.91	6.08	6.97	5.76	6.17	5.76	6.17	8.85	7.38	7.07	6.30	6.59	4.88	5.95	5.15	5.67	6.01
9	4.52	4.67	6.55	5.55	5.74	5.93	4.23	5.47	5.17	6.90	5.63	6.10	5.63	6.10	8.06	7.22	7.93	5.60	6.07	4.57	5.75	4.31	5.88	5.80
10	4.63	4.71	5.87	5.93	6.44	5.76	4.65	5.36	5.53	7.23	5.85	6.33	5.85	6.33	8.30	7.10	8.10	6.74	5.09	4.86	5.80	4.38	6.20	5.95
11	4.98	4.24	6.26	5.07	6.05	5.81	4.92	5.13	5.37	7.21	5.70	6.07	5.70	6.07	8.11	7.05	7.39	5.97	6.15	5.08	5.45	4.53	6.42	5.91

18. MEAN MONTHLY MEANS OF AMOUNT OF CLOUD FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)	(0-10)
S.	5.10	6.48	6.20	5.89	4.88	5.21	5.52	6.02	5.06	4.97	5.68	5.49
S. by E.	5.60	6.40	6.64	6.98	4.72	5.44	5.94	6.16	5.84	4.51	6.06	5.80
S.S.E.	4.79	7.23	7.16	6.25	5.60	4.20	5.87	5.18	5.47	5.46	5.80	6.07
S.E. by S.	4.85	5.72	6.48	6.30	4.87	5.61	6.64	6.18	6.83	5.27	6.16	7.03
S.E.	5.75	6.18	6.63	5.49	6.73	4.28	4.86	4.77	5.88	5.16	5.07	6.54
S.E. by E.	6.04	7.20	7.16	4.75	5.95	2.33	3.97	3.79	5.50	6.27	3.67	5.99
E.S.E.	5.96	5.27	4.86	3.97	6.19	1.72	5.15	5.51	4.19	6.06	4.65	6.02
E. by S.	5.78	6.74	6.50	5.50	4.49	2.75	6.14	6.50	5.05	6.76	4.39	5.27
E.	5.32	4.89	4.92	5.61	5.60	4.27	3.43	5.96	5.87	5.95	5.38	5.54
E. by N.	6.12	3.30	8.29	4.76	4.33	4.32	6.02	6.05	6.82	5.09	6.22	2.61
E.N.E.	5.24	4.21	5.94	4.17	5.08	4.79	4.23	4.00	5.47	4.82	4.63	4.25
N.E. by E.	3.54	4.50	5.74	4.43	5.07	5.66	4.70	5.66	5.85	3.98	4.18	4.47
N.E.	3.77	4.05	5.00	5.35	5.26	4.75	4.36	4.84	5.15	5.15	4.25	4.80
N.E. by N.	4.70	5.00	5.28	6.02	5.27	5.46	5.38	5.17	5.30	5.35	5.35	4.66
N.N.E.	4.47	4.76	5.90	5.81	6.17	5.49	6.00	5.38	5.57	4.76	4.55	4.37
N. by E.	5.08	5.66	5.81	6.11	6.38	6.27	5.04	5.78	5.31	5.17	4.21	5.19
N.	5.29	5.05	6.66	7.12	6.25	6.21	5.78	5.60	5.71	5.10	4.81	4.21
N. by W.	5.16	6.71	7.14	7.46	6.47	5.84	6.06	5.07	5.79	5.25	5.08	4.25
N.N.W.	5.05	5.38	7.08	6.97	7.26	6.06	4.72	5.82	4.53	6.66	5.24	4.39
N.W. by N.	4.55	6.36	7.04	6.99	6.57	5.25	6.56	5.80	6.29	4.30	4.21	4.75
N.W.	5.11	5.62	7.20	5.74	6.21	6.75	6.47	5.86	5.97	5.18	5.16	4.52
N.W. by W.	5.44	6.03	7.91	6.75	6.06	6.59	6.47	6.16	7.00	3.67	6.62	5.47
W.N.W.	5.81	7.04	7.52	6.53	6.78	6.54	7.10	6.63	5.84	5.91	6.13	4.96
W. by N.	3.57	7.35	7.90	4.44	6.74	6.68	6.44	5.69	6.55	5.98	6.04	4.98
W.	6.49	7.39	7.69	8.23	7.48	7.48	7.22	6.92	7.19	6.29	6.36	6.98
W. by S.	7.03	7.99	8.10	8.53	7.19	7.94	7.88	8.14	6.82	7.44	7.37	7.59
W.S.W.	7.79	8.21	8.57	8.60	8.31	8.32	6.81	7.81	7.19	7.24	7.88	6.65
S.W. by W.	6.94	8.13	8.07	7.83	8.59	8.24	8.54	8.37	7.21	7.31	6.68	7.42
S.W.	6.80	7.58	7.99	7.51	6.65	7.43	7.37	7.12	6.99	5.69	6.72	7.00
S.W. by S.	5.26	6.46	2.63	6.41	7.17	7.00	4.80	5.87	6.69	5.43	4.92	5.59
S.S.W.	5.02	6.02	0.69	6.11	5.58	6.28	5.96	5.62	5.68	5.12	5.89	5.79
S. by W.	5.98	6.54	6.22	6.37	5.90	5.58	6.33	5.64	5.80	5.06	5.56	5.70

19. HOURLY VARIATION IN TEMPERATURE OF SURFACE SOIL.

HOUR.	1859.										1860.		1860.										1861.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
Midnight	55.84	52.81	48.25	44.39	42.72	46.93	47.55	53.29	56.13	60.95	61.57	59.93	60.28	53.55	50.59	44.97	42.25	44.85	47.89	51.41	55.15	59.29	62.07	62.05
1h AM	54.83	52.40	48.12	44.06	42.25	46.84	47.13	51.99	55.26	59.99	60.30	58.74	59.65	53.22	50.13	44.59	41.87	44.43	47.24	50.63	54.64	58.14	61.53	61.50
2	54.33	51.90	47.99	43.85	41.48	46.58	46.60	51.11	55.00	59.12	59.29	57.92	59.02	54.65	49.63	44.09	41.55	43.98	46.68	50.51	53.79	57.38	60.91	60.60
3	53.62	51.31	47.66	43.48	41.19	46.28	46.02	50.39	54.39	58.24	58.43	55.91	58.42	52.45	49.15	43.73	41.36	43.71	46.35	50.28	53.03	57.05	60.22	59.81
4	53.52	50.92	47.28	43.62	41.03	46.08	45.76	50.34	53.80	57.64	57.89	56.44	57.79	52.28	49.02	43.48	41.05	43.40	45.76	49.97	52.83	56.72	59.40	59.56
5	52.91	50.52	47.07	43.60	40.82	45.88	45.61	49.96	53.76	57.94	57.95	55.99	57.37	52.13	49.03	43.16	40.86	43.02	45.01	49.82	53.62	57.81	59.40	59.03
6	52.60	50.42	46.98	43.60	40.71	45.58	45.22	50.92	56.60	62.33	62.17	57.02	56.86	51.67	48.81	42.88	40.55	42.98	45.07	51.03	55.95	61.01	62.16	59.20
7	56.15	52.07	47.01	43.44	40.22	45.82	48.67	56.24	63.42	70.99	69.55	61.54	60.16	53.33	49.34	43.05	40.35	43.90	49.46	56.57	62.27	67.00	67.38	61.75
8	63.69	57.65	49.44	44.47	42.24	48.63	53.91	62.95	69.97	79.55	78.19	71.13	67.75	57.53	51.86	44.69	41.83	47.29	55.28	60.98	69.87	74.29	74.19	67.21
9	73.40	64.78	53.36	47.44	46.16	52.62	60.67	68.91	77.42	88.57	86.19	81.85	76.84	63.47	57.31	48.64	46.02	52.33	61.70	67.10	72.46	78.35	80.14	73.58
10	82.49	71.91	57.70	50.53	50.97	57.24	65.65	75.58	84.33	96.95	93.50	91.56	85.88	68.90	62.74	52.88	51.10	60.13	67.18	73.43	81.04	84.00	85.93	78.60
11	89.20	75.43	60.02	53.68	54.81	60.32	70.07	80.02	88.98	101.18	100.68	98.81	92.02	73.13	65.82	56.83	55.53	66.55	71.40	76.24	87.13	89.13	90.46	84.06
Noon	93.90	77.45	61.46	55.81	57.39	63.79	71.78	83.20	96.99	104.81	104.24	102.68	94.78	75.58	67.89	59.91	57.97	70.96	74.63	79.31	91.57	92.81	93.20	86.80
1h PM	96.50	79.22	62.43	56.00	57.92	65.53	72.28	84.76	97.88	103.94	103.13	104.08	97.86	75.81	67.46	59.52	59.10	71.89	75.33	79.76	90.58	92.46	92.65	87.82
2	95.00	78.26	61.30	55.70	57.65	63.89	72.29	82.90	94.57	104.22	101.65	101.86	95.88	74.43	66.86	58.75	59.36	71.15	72.86	75.38	87.94	89.69	92.17	87.05
3	87.40	75.93	57.83	52.34	52.83	61.66	69.84	80.11	90.09	99.25	98.86	97.43	91.74	72.00	61.53	54.84	53.71	66.09	69.40	74.96	84.14	86.76	90.28	85.04
4	83.17	70.32	55.65	50.25	50.54	58.22	65.99	75.08	82.37	92.87	93.38	90.71	85.93	68.92	59.23	52.30	49.33	61.01	64.74	69.91	77.55	82.88	84.64	81.20
5	74.03	64.28	53.18	48.77	47.76	54.09	60.51	68.49	76.24	87.32	84.94	86.54	79.18	62.63	55.78	50.01	47.84	54.17	59.14	64.95	72.91	77.95	81.26	76.89
6	65.77	60.28	51.58	47.81	45.93	51.14	55.98	62.37	69.46	76.95	77.58	77.82	71.88	59.32	54.36	50.01	46.38	50.76	55.26	59.43	65.09	71.20	74.76	72.03
7	61.79	58.46	50.45	47.06	45.40	49.98	53.84	59.20	63.82	71.59	71.01	67.93	67.66	58.12	53.72	48.25	45.33	49.22	52.43	56.32	60.71	66.26	68.90	68.87
8	59.87	56.94	49.81	46.26	44.66	48.81	52.59	57.53	61.54	67.95	67.88	65.15	65.50	56.82	52.92	47.65	44.57	48.11	51.21	54.81	59.01	63.20	65.82	67.08
9	58.66	55.93	49.00	45.59	44.33	48.16	51.38	56.29	60.04	65.12	65.67	63.44	63.72	56.25	52.12	46.97	43.86	46.99	50.06	53.92	57.68	62.36	64.63	65.73
10	57.85	54.82	48.42	45.32	43.79	47.28	50.68	55.03	58.55	63.29	64.31	61.87	62.27	55.08	51.43	46.29	43.09	46.36	49.30	52.93	56.45	61.28	63.34	64.41
11	56.65	53.91	48.01	44.94	43.29	46.88	49.73	53.83	57.05	61.98	62.48	60.84	61.38	54.48	50.99	45.62	42.49	45.53	47.95	52.26	55.61	60.69	62.47	63.40

HOUR.	1861.										1862.		1862.										1863.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
Midnight	64°11	—	50°15	47°71	44°44	46°56	49°99	54°54	56°81	60°55	64°32	64°49	62°20	54°27	50°03	47°24	47°85	47°79	—	53°93	60°95	61°90	66°48	65°09
1h AM	63°50	—	49°44	47°43	44°16	46°00	49°26	53°84	55°89	59°89	63°23	64°20	61°36	53°68	49°95	47°12	47°37	47°36	—	53°25	59°93	60°99	65°85	64°51
2	62°96	—	48°77	46°82	43°89	45°41	48°60	53°13	55°11	58°89	62°24	63°91	60°85	53°14	49°26	46°83	47°12	47°05	—	52°74	59°25	60°15	64°95	64°00
3	62°41	—	48°56	46°50	43°40	45°06	47°80	52°60	54°42	57°91	61°45	63°16	60°40	52°39	48°92	46°52	46°79	46°81	—	52°26	58°32	59°53	64°26	63°41
4	62°02	—	48°51	46°15	43°19	44°59	47°39	51°98	53°90	57°11	60°86	62°88	59°78	51°90	48°71	46°24	46°56	46°73	—	51°75	57°58	59°11	63°83	63°18
5	61°65	—	48°42	46°05	42°99	44°50	46°76	51°47	53°66	56°80	60°83	62°33	59°15	51°71	48°68	46°11	46°67	46°37	—	51°48	57°37	59°14	63°37	62°87
6	61°46	—	48°23	45°96	42°60	44°34	46°51	51°72	55°50	59°76	63°63	62°55	58°69	51°71	48°47	45°99	46°53	46°30	—	52°45	60°72	61°44	64°99	63°25
7	63°32	—	48°40	46°45	43°31	44°75	48°27	54°02	59°74	64°78	69°68	66°42	61°05	52°67	48°52	45°87	46°37	46°34	—	57°78	67°92	68°17	70°08	65°82
8	67°75	—	50°04	46°89	43°94	46°50	53°12	60°35	66°85	71°52	77°89	72°49	66°63	57°21	50°17	46°44	47°05	47°49	—	63°26	74°26	74°31	75°94	69°22
9	74°39	—	52°99	48°95	46°30	49°86	58°02	64°45	73°52	77°24	86°62	82°25	73°10	60°92	52°98	47°99	48°59	49°34	—	70°46	80°75	82°25	83°03	74°77
10	80°21	—	56°88	52°60	49°57	53°17	61°22	67°91	77°48	81°58	92°67	90°08	78°20	64°37	56°16	50°62	50°80	51°68	—	75°92	85°71	87°71	87°22	78°20
11	85°97	—	60°96	57°19	53°28	57°47	67°31	71°96	82°70	86°29	99°91	95°12	86°24	69°95	59°34	53°32	53°17	54°38	—	77°95	89°59	93°10	91°85	81°91
Noon	86°88	—	63°77	59°53	56°51	59°29	71°22	74°61	86°64	89°86	106°11	99°84	92°49	72°49	60°07	55°20	54°44	57°02	—	81°22	91°46	95°72	94°10	83°52
1h PM	88°60	—	65°03	61°25	56°72	60°95	72°97	76°37	89°16	91°19	106°54	103°01	92°69	73°80	60°77	55°99	55°03	58°16	—	85°07	90°82	97°68	95°37	86°92
2	87°03	—	64°26	60°57	55°92	60°79	71°86	75°94	85°92	91°30	105°16	101°96	91°67	72°92	60°80	56°10	54°78	58°22	—	84°12	90°65	98°25	97°39	88°67
3	85°06	—	61°09	57°01	52°58	58°79	68°74	73°20	82°09	90°14	102°31	97°97	89°48	71°28	57°56	53°70	52°77	56°40	—	80°41	87°57	95°30	95°32	87°67
4	81°66	—	58°53	54°70	50°45	56°42	64°64	68°97	76°96	84°91	94°48	91°88	83°60	67°05	55°78	51°93	51°64	54°42	—	74°58	84°08	90°71	91°65	84°62
5	76°01	—	55°75	52°10	48°64	53°26	60°98	65°57	73°48	78°38	86°83	84°02	77°71	62°83	53°89	50°34	50°29	52°11	—	70°76	79°04	83°90	84°82	79°92
6	71°93	—	54°07	50°90	47°24	51°35	57°21	62°09	67°67	72°38	79°66	77°16	72°16	59°50	52°96	49°59	49°67	50°67	—	64°42	73°16	77°89	80°34	75°25
7	69°23	—	53°08	50°01	46°46	49°92	55°31	59°45	64°06	67°92	73°85	71°31	69°26	58°12	52°28	49°13	49°25	50°07	—	60°46	68°45	71°03	74°30	70°32
8	67°86	—	51°92	49°43	45°84	49°12	53°94	58°27	62°08	65°66	70°54	68°55	67°25	57°00	51°66	48°52	49°03	49°34	—	58°25	66°01	68°25	71°09	68°88
9	66°60	—	51°27	48°84	45°20	48°40	52°86	57°04	60°52	63°98	68°22	66°86	65°62	55°92	51°27	48°00	48°75	48°92	—	56°84	64°32	66°33	69°60	67°16
10	65°23	—	50°61	48°33	44°85	47°83	51°95	56°10	59°35	62°69	66°82	65°88	64°18	55°23	50°82	47°54	48°56	48°44	—	55°98	63°20	64°61	68°77	66°28
11	64°78	—	50°12	47°87	44°57	47°26	51°00	54°97	57°94	61°66	65°41	64°66	63°19	54°31	50°50	47°09	48°23	47°85	—	54°95	62°04	63°16	67°77	65°44

20. HOURLY VARIATION IN DURATION OF RAIN.

HOUR.	1859.										1860.		1860.										1861.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.
Midnight	0.026	0.017	0.000	0.100	0.040	0.016	0.116	0.033	0.067	0.043	0.080	0.000	0.007	0.087	0.020	0.051	0.040	0.023	0.094	0.090	0.003	0.070	0.097	0.096
1h A M	.027	.017	.067	.090	.058	.007	.133	.083	.123	.053	.050	.027	.010	.067	.023	.043	.053	.050	.037	.103	.020	.060	.068	.118
2	.023	.040	.107	.129	.087	.050	.120	.117	.084	.073	.033	.060	.013	.060	.017	.014	.043	.047	.000	.123	.050	.077	.035	.107
3	.013	.067	.080	.147	.103	.049	.097	.113	.073	.090	.023	.050	.007	.040	.053	.051	.057	.033	.010	.113	.067	.033	.071	.071
4	.037	.063	.067	.144	.064	.047	.113	.123	.070	.037	.037	.020	.010	.043	.013	.077	.067	.050	.013	.183	.090	.070	.061	.093
5	.023	.043	.040	.140	.114	.003	.093	.093	.040	.033	.030	.003	.037	.067	.017	.087	.080	.043	.010	.130	.083	.077	.010	.096
6	.067	.057	.057	.106	.070	.057	.070	.010	.033	.020	.037	.000	.040	.071	.013	.070	.107	.067	.033	.103	.053	.140	.113	.057
7	.083	.073	.060	.140	.108	.057	.067	.050	.007	.000	.043	.000	.067	.117	.013	.014	.050	.027	.083	.070	.053	.127	.119	.057
8	.067	.043	.017	.171	.113	.083	.080	.060	.027	.008	.020	.010	.073	.103	.044	.036	.010	.087	.107	.047	.063	.150	.123	.075
9	.037	.010	.043	.094	.075	.077	.080	.072	.090	.004	.037	.003	.030	.103	.000	.046	.067	.003	.117	.040	.070	.130	.055	.079
10	.030	.017	.097	.086	.033	.073	.057	.047	.057	.007	.027	.033	.047	.117	.000	.070	.033	.000	.077	.023	.050	.143	.036	.061
11	.020	.013	.077	.049	.033	.097	.050	.037	.043	.020	.022	.033	.067	.120	.000	.086	.033	.020	.067	.017	.050	.117	.044	.025
Noon	.007	.017	.057	.074	.037	.057	.067	.020	.037	.033	.033	.033	.037	.097	.003	.037	.040	.000	.082	.030	.017	.133	.052	.036
1h P M	.017	.000	.023	.090	.040	.010	.097	.100	.017	.022	.010	.037	.033	.070	.017	.071	.020	.000	.110	.037	.027	.100	.060	.039
2	.000	.007	.013	.111	.052	.023	.093	.057	.020	.017	.004	.037	.033	.127	.047	.051	.043	.023	.037	.067	.047	.117	.076	.029
3	.003	.037	.050	.111	.058	.063	.107	.033	.014	.024	.023	.033	.033	.140	.040	.040	.057	.017	.050	.037	.057	.133	.058	.054
4	.003	.033	.087	.154	.072	.037	.110	.010	.007	.037	.030	.040	.033	.093	.030	.049	.047	.023	.098	.057	.073	.143	.081	.107
5	.003	.027	.065	.130	.067	.047	.117	.043	.033	.037	.010	.023	.027	.133	.053	.063	.013	.020	.080	.017	.067	.100	.090	.064
6	.003	.033	.065	.129	.050	.023	.098	.047	.030	.030	.047	.030	.017	.123	.040	.046	.040	.083	.110	.023	.037	.117	.087	.032
7	.040	.020	.057	.106	.027	.042	.117	.097	.017	.053	.037	.040	.000	.097	.023	.094	.063	.053	.093	.043	.037	.133	.097	.057
8	.047	.083	.060	.070	.050	.050	.100	.094	.000	.050	.037	.033	.003	.153	.093	.083	.083	.043	.070	.067	.033	.137	.123	.036
9	.023	.063	.070	.129	.050	.053	.087	.153	.007	.050	.037	.037	.007	.137	.087	.063	.093	.037	.097	.067	.017	.120	.116	.057
10	.008	.060	.043	.131	.070	.063	.057	.107	.010	.023	.037	.033	.000	.087	.133	.057	.037	.033	.077	.090	.033	.117	.148	.050
11	.033	.050	.040	.092	.040	.047	.068	.072	.052	.033	.077	.037	.000	.097	.043	.063	.003	.017	.100	.123	.010	.093	.071	.046

HOUR.	1861.										1862.		1862.										1863.	
	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Febr.
	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.	hour.
Midnight	0.074	0.073	0.035	0.067	0.116	0.081	0.067	0.081	0.030	0.058	0.032	0.007	0.026	0.143	0.155	0.080	0.074	0.139	0.035	0.061	0.000	0.016	0.064	0.107
1h A M	.097	.057	.010	.070	.065	.100	.060	.035	.007	.071	.023	.000	.029	.190	.148	.087	.074	.097	.042	.058	.023	.026	.061	.100
2	.068	.003	.003	.060	.145	.087	.067	.071	.010	.074	.006	.000	.006	.163	.126	.133	.074	.061	.042	.068	.007	.010	.077	.121
3	.035	.000	.039	.033	.094	.055	.080	.090	.023	.048	.000	.000	.010	.150	.129	.100	.084	.039	.006	.055	.017	.006	.087	.096
4	.003	.010	.039	.040	.065	.097	.087	.074	.030	.029	.003	.011	.023	.133	.126	.080	.084	.029	.003	.071	.027	.003	.077	.118
5	.003	.060	.035	.020	.042	.084	.073	.058	.017	.071	.000	.004	.065	.063	.084	.087	.058	.039	.023	.065	.037	.000	.048	.161
6	.042	.040	.035	.007	.084	.116	.093	.071	.020	.084	.006	.000	.065	.040	.113	.073	.071	.039	.016	.071	.003	.000	.061	.182
7	.077	.083	.081	.037	.055	.103	.090	.081	.060	.052	.023	.000	.045	.073	.094	.083	.110	.068	.006	.029	.000	.000	.097	.182
8	.100	.070	.068	.020	.058	.065	.133	.081	.033	.094	.032	.000	.094	.060	.071	.097	.106	.109	.010	.026	.023	.003	.052	.175
9	.035	.100	.016	.093	.103	.052	.080	.074	.023	.065	.032	.000	.058	.100	.052	.087	.123	.029	.000	.048	.000	.000	.039	.146
10	.048	.050	.061	.083	.032	.048	.043	.081	.017	.068	.032	.000	.013	.110	.055	.083	.052	.042	.013	.023	.000	.016	.032	.107
11	.032	.073	.045	.127	.016	.090	.040	.116	.037	.039	.032	.000	.000	.103	.068	.047	.048	.058	.039	.026	.003	.010	.026	.078
Noon	.032	.057	.129	.057	.016	.045	.030	.110	.030	.042	.016	.011	.000	.103	.077	.047	.058	.065	.055	.013	.017	.016	.016	.075
1h P M	.032	.047	.071	.020	.052	.016	.003	.081	.017	.052	.010	.036	.000	.080	.068	.043	.106	.039	.045	.003	.014	.029	.026	.089
2	.042	.047	.084	.010	.106	.016	.063	.094	.047	.069	.000	.032	.006	.057	.090	.083	.135	.100	.061	.003	.043	.003	.006	.075
3	.032	.073	.087	.000	.142	.029	.097	.039	.070	.042	.000	.018	.026	.047	.142	.087	.158	.110	.087	.016	.023	.000	.000	.078
4	.042	.078	.045	.000	.119	.039	.080	.045	.033	.071	.023	.000	.039	.037	.113	.067	.094	.123	.023	.007	.013	.000	.003	.082
5	.058	.072	.061	.003	.116	.087	.070	.061	.040	.058	.019	.011	.042	.027	.126	.073	.076	.103	.032	.035	.050	.013	.003	.093
6	.042	.017	.103	.027	.100	.065	.090	.061	.040	.060	.016	.029	.045	.013	.158	.070	.019	.110	.061	.048	.083	.013	.013	.104
7	.023	.050	.194	.013	.094	.100	.090	.100	.070	.068	.006	.011	.029	.067	.235	.060	.052	.148	.071	.023	.037	.035	.010	.118
8	.000	.047	.129	.017	.145	.068	.107	.071	.063	.058	.029	.004	.010	.033	.177	.020	.065	.094	.013	.032	.020	.010	.016	.111
9	.039	.040	.077	.067	.094	.052	.083	.094	.040	.026	.006	.039	.000	.067	.168	.023	.055	.052	.032	.023	.000	.019	.010	.121
10	.048	.040	.058	.043	.110	.119	.067	.065	.047	.032	.003	.018	.000	.110	.155	.097	.055	.139	.045	.026	.007	.003	.003	.082
11	.035	.023	.065	.020	.103	.158	.073	.068	.043	.042	.058	.011	.000	.130	.142	.080	.081	.116	.023	.048	.003	.026	.016	.086

21. MEAN NUMBER OF HOURS OF RAIN FOR EACH POINT OF THE COMPASS.

DIRECTION OF WIND.	Derived from observations During the years 1858 to 1863.											
	March.	April.	May.	June.	July.	August.	September	October.	November	December.	January.	February.
S.	2.50	2.17	2.43	0.45	0.71	2.28	2.50	2.78	1.48	2.47	3.08	5.30
S. by E.	0.42	0.88	0.70	0.10	0.40	0.94	1.08	0.45	0.44	0.12	2.08	1.96
S.S.E.	0.54	1.64	0.75	0.62	0.62	0.48	0.68	0.84	0.62	1.00	1.62	1.19
S.E. by S.	0.46	0.25	0.19	0.55	0.03	0.00	0.28	0.18	0.00	0.48	0.90	0.12
S.E.	0.79	3.47	1.52	0.78	3.87	0.20	0.81	0.50	1.90	1.34	1.34	2.70
S.E. by E.	0.15	0.53	0.00	0.02	1.66	0.00	0.10	0.00	0.88	0.27	0.02	0.30
E.S.E.	0.46	0.24	0.16	0.00	0.33	0.10	0.32	0.27	0.34	1.22	0.20	0.22
E. by S.	0.20	0.76	0.16	0.00	0.00	0.00	0.33	0.00	0.05	1.38	0.37	0.20
E.	1.20	0.31	0.44	0.00	1.32	0.04	0.66	0.46	1.33	3.32	0.80	0.26
E. by N.	1.39	0.08	0.12	0.30	0.06	0.02	0.57	0.26	0.46	0.34	0.60	0.00
E.N.E.	0.86	0.40	0.65	0.45	0.36	0.30	0.80	1.02	1.02	1.42	0.48	0.14
N.E. by E.	0.70	0.46	0.38	0.04	0.00	0.44	0.05	0.86	0.30	0.68	0.45	0.70
N.E.	1.95	2.41	3.30	3.84	3.31	2.76	1.81	2.59	1.80	4.32	2.37	0.56
N.E. by N.	0.28	0.78	1.00	1.54	0.42	0.94	0.20	1.23	0.14	1.04	0.64	0.54
N.N.E.	0.24	1.14	3.58	3.13	2.98	3.25	2.54	1.06	1.46	1.02	1.38	0.62
N. by E.	0.08	0.50	2.11	2.61	1.48	1.96	0.66	0.84	0.52	0.30	0.24	0.64
N.	0.53	1.30	4.28	6.79	6.88	5.38	4.86	2.28	0.96	1.00	0.87	0.92
N. by W.	0.02	0.26	0.65	1.67	2.08	0.53	1.03	0.50	0.58	1.19	0.90	0.06
N.N.W.	1.16	1.20	2.66	1.82	2.94	1.02	1.14	0.63	0.72	1.73	0.04	0.08
N.W. by N.	0.62	0.74	0.74	0.99	0.48	0.42	0.25	0.18	0.30	0.33	0.00	0.00
N. W.	0.76	1.76	4.20	2.20	2.34	2.10	3.22	1.40	0.82	1.34	1.42	0.58
N.W. by W.	0.32	0.86	0.68	0.73	0.54	0.16	0.34	0.30	0.26	0.00	0.00	0.12
W.N.W.	0.32	0.92	1.63	1.63	1.60	0.78	1.69	1.00	0.55	0.52	0.68	0.00
W. by N.	0.10	1.80	1.73	0.90	0.91	1.22	0.71	0.80	0.62	0.82	0.39	0.00
W.	2.77	5.85	4.65	7.19	8.71	6.60	8.50	5.10	3.62	3.87	1.24	1.45
W. by S.	1.10	1.59	1.48	1.40	2.01	3.53	4.16	2.09	1.57	2.06	1.13	1.30
W.S.W.	1.14	3.38	2.61	3.93	3.21	3.70	2.47	1.46	1.46	2.00	2.07	2.06
S.W. by W.	1.43	1.17	1.68	1.01	1.41	1.27	1.19	1.22	0.62	0.52	1.09	0.54
S.W.	2.00	2.23	2.97	1.39	3.32	3.66	4.79	4.52	3.00	3.28	4.00	2.18
S.W. by S.	0.62	0.24	0.51	0.15	0.80	0.46	0.13	1.16	0.57	0.64	0.44	0.20
S.S.W.	1.04	2.10	0.79	0.82	0.48	2.02	0.98	3.63	1.94	1.33	1.44	0.42
S. by W.	0.91	1.26	0.65	0.34	0.80	0.88	0.88	1.86	0.66	1.14	1.18	2.66

ADDITIONAL ERRATA TO VOL. I. AND VOL. II.

VOL. I.

- Page 2, line 19, *for d (b—c) read d (b—e).*
 „ 29, Aug. 28, remarks, *after (8 p.m.) insert Thunder.*
 „ 50, Jan. 31, 10th col., *for 0.301 read 0.347.*
 „ 50, Feb. 10, 10th col., *for 0.354 read 0.324.*
 „ 50, Feb. 14, 5th and 8th cols., *for 29.794 and 0.379 read 29.788 and 0.385.*
 „ 50, Feb. 22, 9th col., *for 0.520 read 0.427.*
 „ 51, Feb. 11, 10th col., *for 47.5 read 45.2.*
 „ 56, 10^h, 11th col., *for 00.54 read 60.54.*
 „ 61, Jan., 2nd and 3rd cols., *for 49 and 80 read 80 and 86.*
 „ 62, 2nd table, line 1, *after 128.0 insert hours.*
 „ 71, in table, May, 4th col., *for 0.247 read 1.247.*
 „ 84, No. 19, last col., *for γ Argus read β Argus.*
 „ 84, Nos. 33 and 34, 4th col., *for 2^h 5^m p.m. and 12^h 4^m p.m. read 2^h 5^m a.m. and 12^h 4^m a.m.*
 „ 90, Nos. 146 and 147, *for 6^h 25^m a.m. and 6^h 35^m a.m. read 6^h 25^m p.m. and 6^h 35^m p.m.*
 „ 92, No. 218, Jan. 14th, 6th and last cols., *for S. 70° W. and Leonis read S. 75° W. and Leporis.*
 „ 101, March 19, 4 a.m., *for E. $\frac{1}{2}$ W. read E. $\frac{1}{2}$ N.*
 „ 143, Amount of cloud, Melbourne, 8th col., *for 8.2 read 0.8.*
 „ 148, Ballarat, June, 7th col., *for 29.865 read 28.865.*
 „ 160, 2nd table, July, 3rd col., *for 2.250 read 4.250.*
 „ 160, last line, *for 30.870 read 32.870.*
 „ 161, 1st table, May and Feb., 8th col., *for 4.92 and 6.08 read 6.12 and 4.86.*
 „ 162, line 7, *for on the 21st read on the 25th.*
 „ 162, at end of par. 140, *add—“Portland.—Lightning on the 6th and 13th and thunderstorm on the 12th.”*
 „ 163, at end of par. 141, *add—“Heathcote.—Thunderstorm on the 22nd and 28th.” “Sandhurst.—ditto.”*
 „ 197, Aug. 22, 3rd col., *for 78° 0' read 88° 0'.*

VOL. II.

- Page 19, Mar. 24, in the remarks, *for to Phoenix read to α Phoenicis.*
 „ 28, means for Sept., 8th col., *insert 53.9.*
 „ 44, means for June, 4th col., *for 49.21 read 43.90.*
 „ 80, Dec. 8, 7th col., *for 39.842 read 29.842.*
 „ 96, means for July, 7th col., *for 29.804 read 29.709.*
 „ 103, Oct., 3rd col., *for 5.48, 5.73, &c., read 54.8, 57.3, &c. (decimal points misplaced).*
 „ 120, Jan., 10th col., *for 4.65 read 2.65.*
 „ 122, 2nd table, line 1, *for 10.5 read 11.1.*
 „ 132, 2nd table, line 4, *for 11^h 0^m read 12^h 0^m.*
 „ 145, line 10, *for 1000 feet read 942.11 feet.*
 „ 154, Melbourne, Amount of rain, 8th, 12th and 13th cols., *for 2.685, 1.186, and 0.444, read 2.679, 1.177, and 0.044.*
 „ 160, Melbourne, Amount of rain, 5th col., *for 4.467 read 2.467.*
 „ 161, Melbourne, Amount of rain, 6th col., *for 0.320 read 0.032.*
 „ 162, Melbourne, Temperature of air, 12th col., *insert 50.4.*
 „ 170, Melbourne, Amount of rain, *for 0.050 read 0.000.*
 „ 223, 2nd table, 0.029 to be subtracted from the last three values for Melbourne, correction necessary to reduce them to the other observations; value of mean thus altered to 29.882.
 „ 306, throughout the headings, *for in W. L. read in S. L.*
 „ 343, line 9, *for parallel of 60° read parallel of 60° and 55° respectively.*
 „ 343, lines 22, 23, and 27, *for 100, 12770, and 25736, read 600, 13270, and 26236.*
 „ 374, line 10, *for 35° 40' read 38° 40'.*
 „ iv, 2nd heading, *for 58°—45° N. lat. read 50°—45° N. lat.*
 „ lxvii, remarks, line 9, *for void read veil.*

ERRATA TO VOL. III.

PART I.

- Page 12, line 12, for — u' read = u'.
" 13, " 14, for Appendix 4 read Appendix 5.
" 13, " 24, for No. 4 read No. 5.
" 15, " 30, for No. 4 read No. 5.
" 17, " 9, for No. 4 read No. 5.
" 19, " 7, for No. 6 and 7 read No. 6.
" 22, " 5, for No. 6 read No. 7.
" 59, in table, in heads of 4th and 9th cols., insert a.m.
" 69, line 7, for wind. inch. read wind.
" 71, " 12, for insolation read insulation.
" 94, " 9, for parts read degrees.
" 116, " 5, for wich I arrive read which I arrived.
" 119, " 4, for as early circumstances read as early as circumstances.
" 121, " 22, before 30° to 40° insert from.
" 121, " 23, for from in the read in the.

PART II.

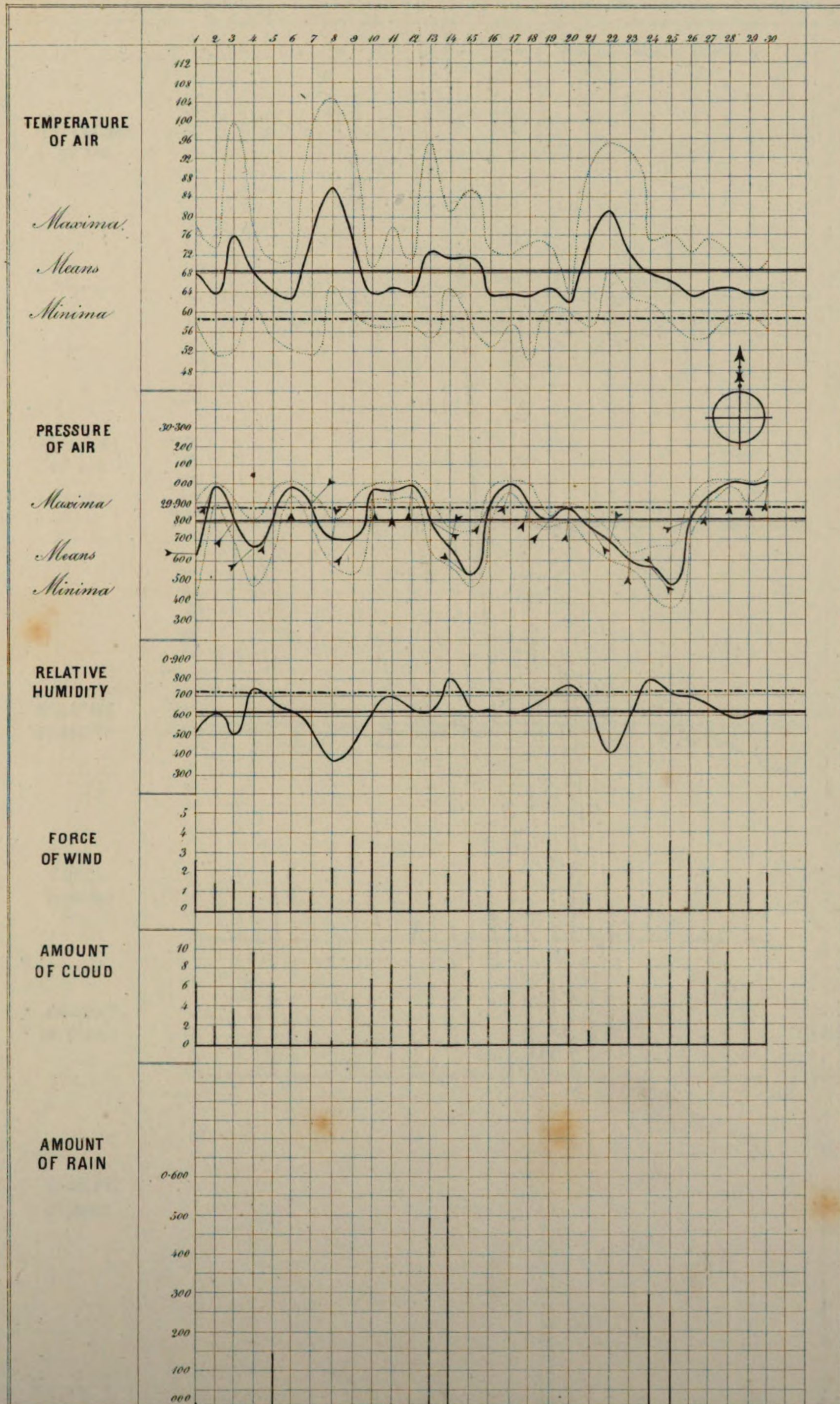
- Page 24, in the heads, for 0·802 min. read 1·071 min.
" 40, line 11, for June 1857 read June 1859.
" 85, in the heads, for 0·0001,16 read 0·0001,84.
" 89, line 22, for September read August.
" 95, Sept. 62, 2nd col., in both tables, insert 1·80.
" 100, in table, last line, 3rd col., for 6·734 read 10·901.
" 101, line 5, for = 6·734 read = 10·901.
" 152, in table, 2nd col., last line, for 3·3660 read 2·3660.

APPENDIX.

- Page vii, 9th col., line 7, for 79·77 read 69·77.

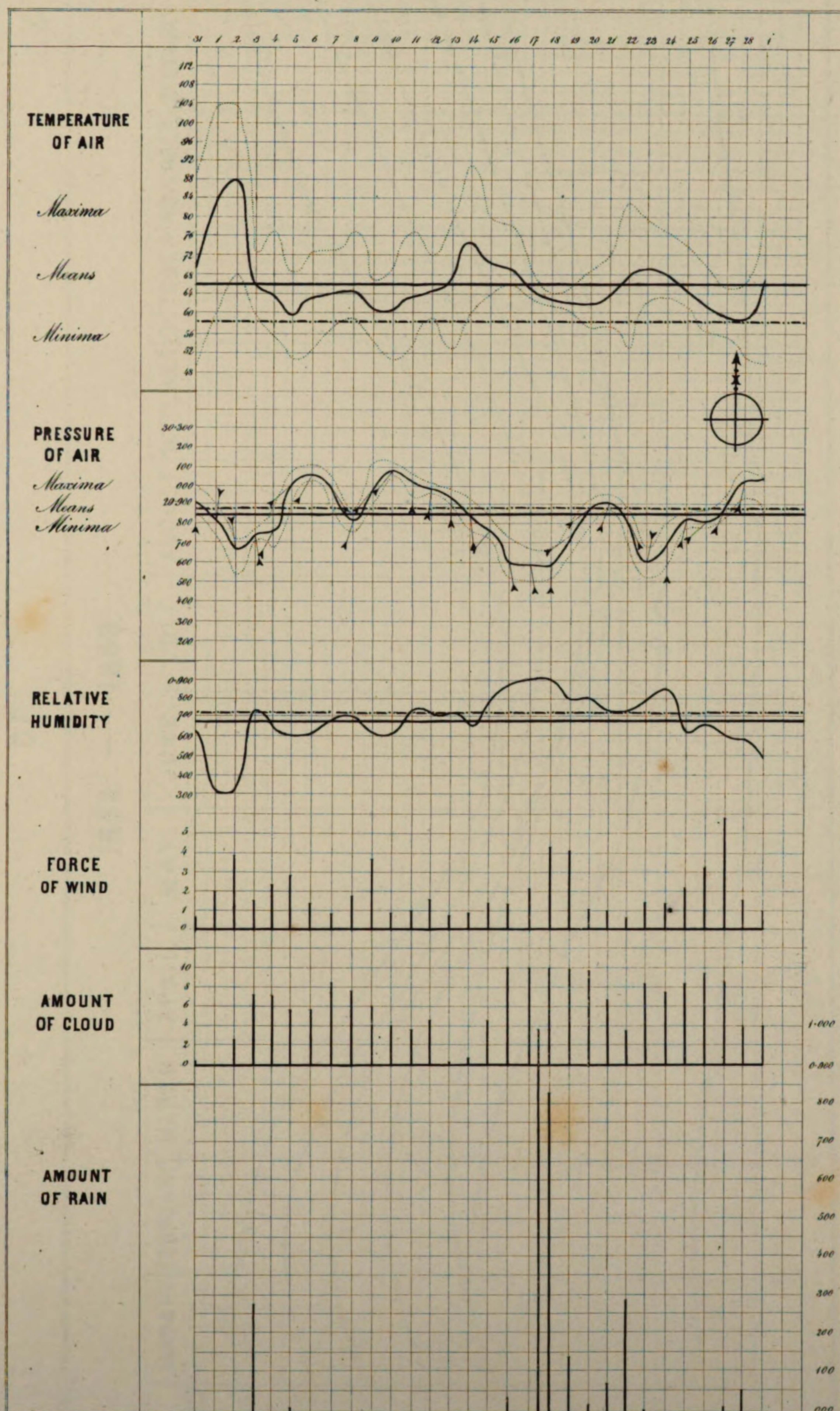
JANUARY, 1863

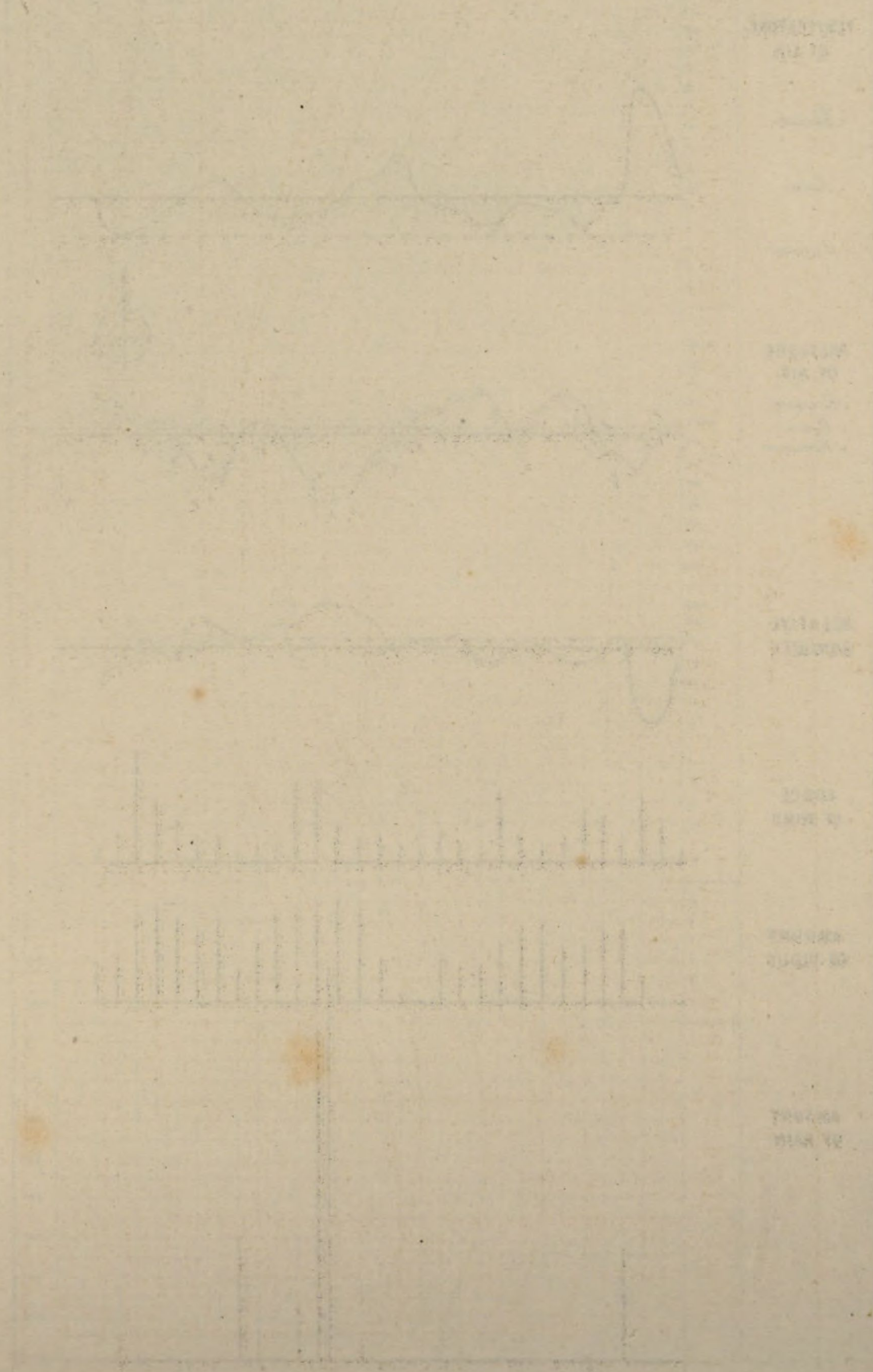
Table 1.



FEBRUARY, 1863.

Table 2.





1901
1902

1903
1904

1905
1906

1907
1908

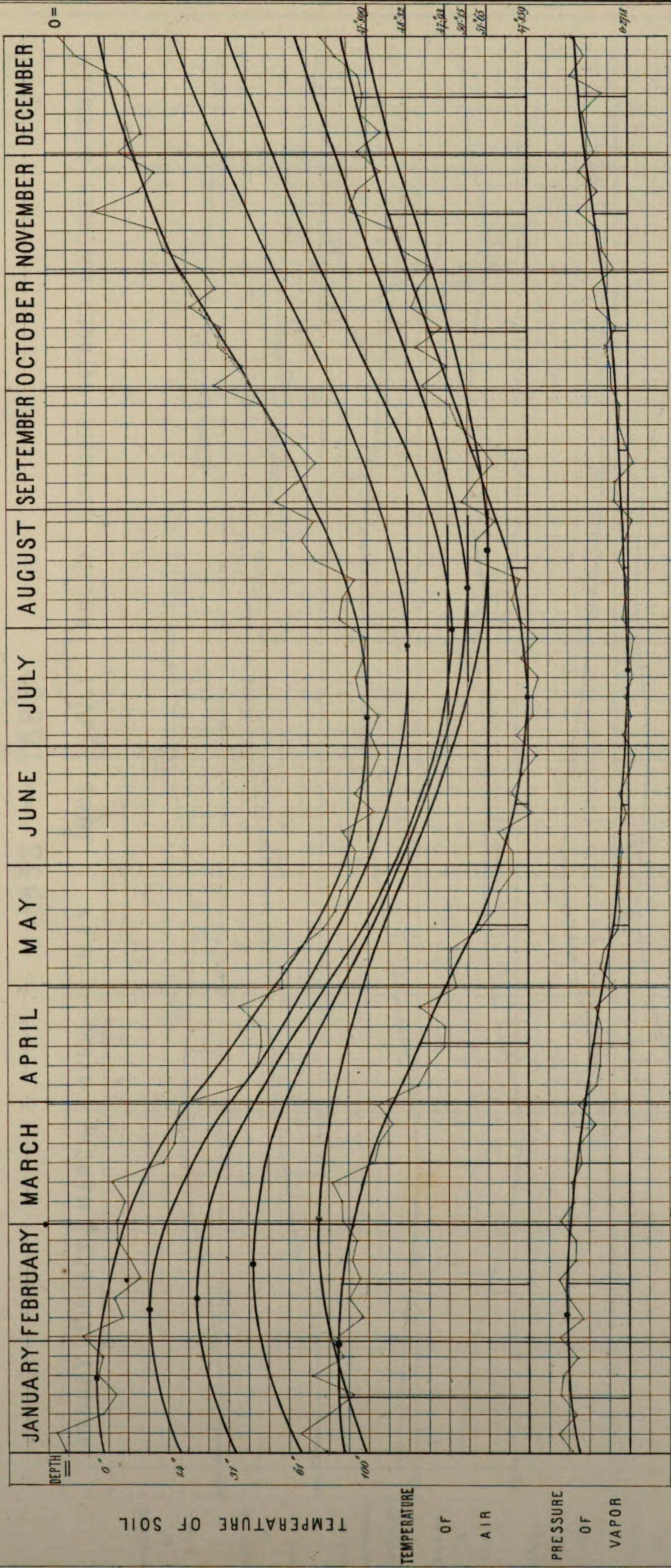
1909
1910

1911
1912

CURVES SHEWING THE ANNUAL MARCH

Table 3.

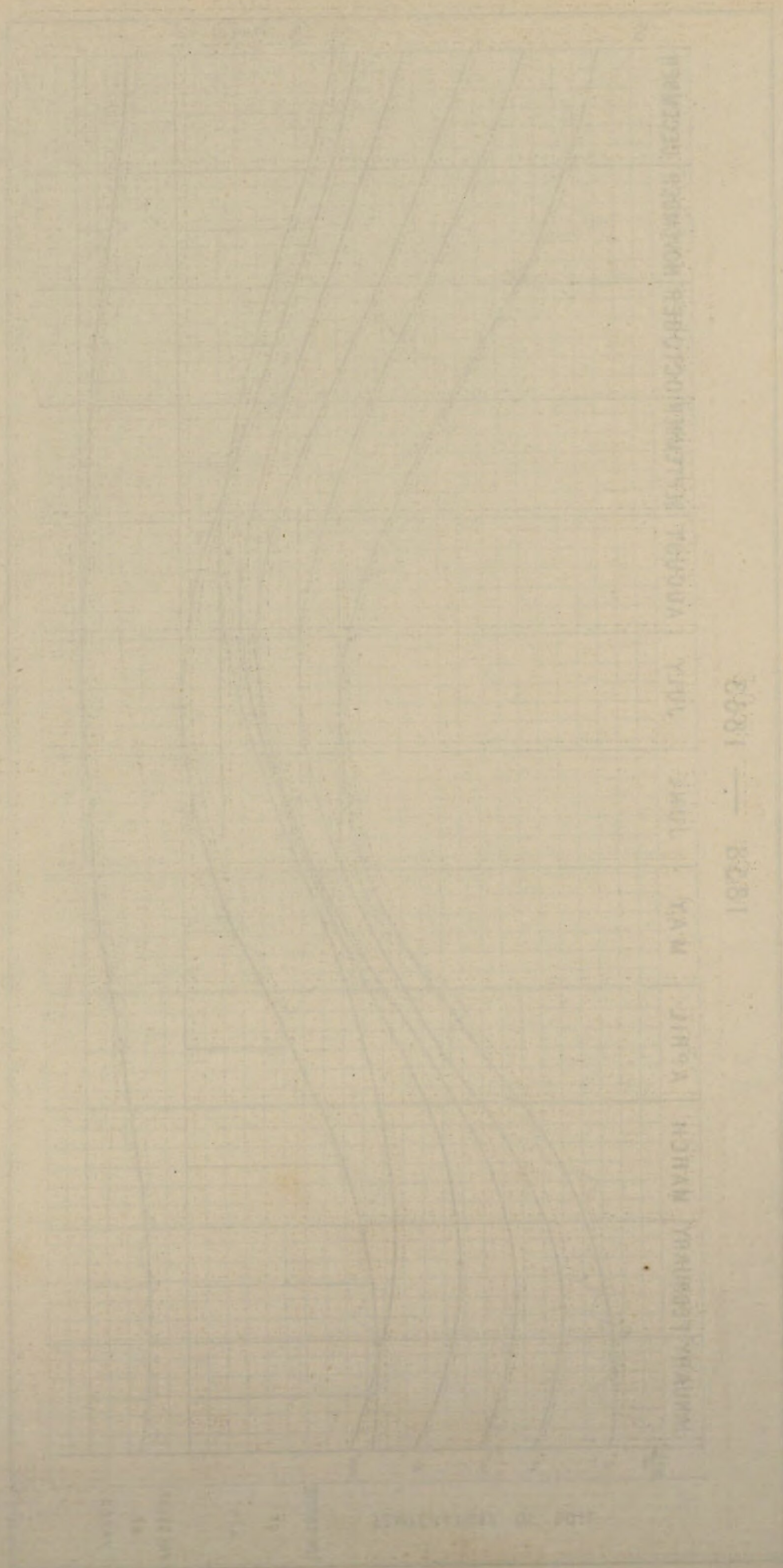
1858 — 1863



НОРАМ ЯАУИНА ЭИТ ОИУЭНЭ ЗЭВРУО

70

1821 — 1822

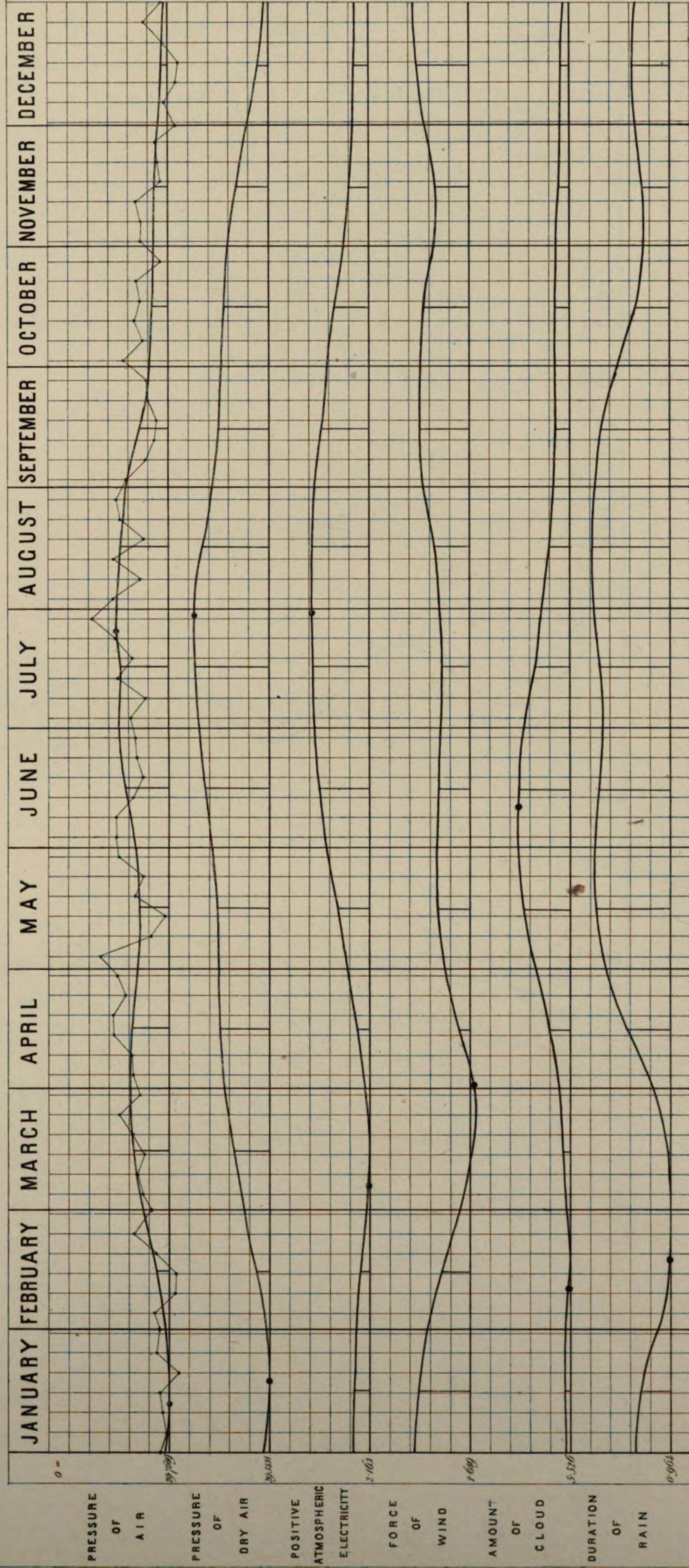


CURVES SHEWING THE ANNUAL MARCH

OF

Table A.

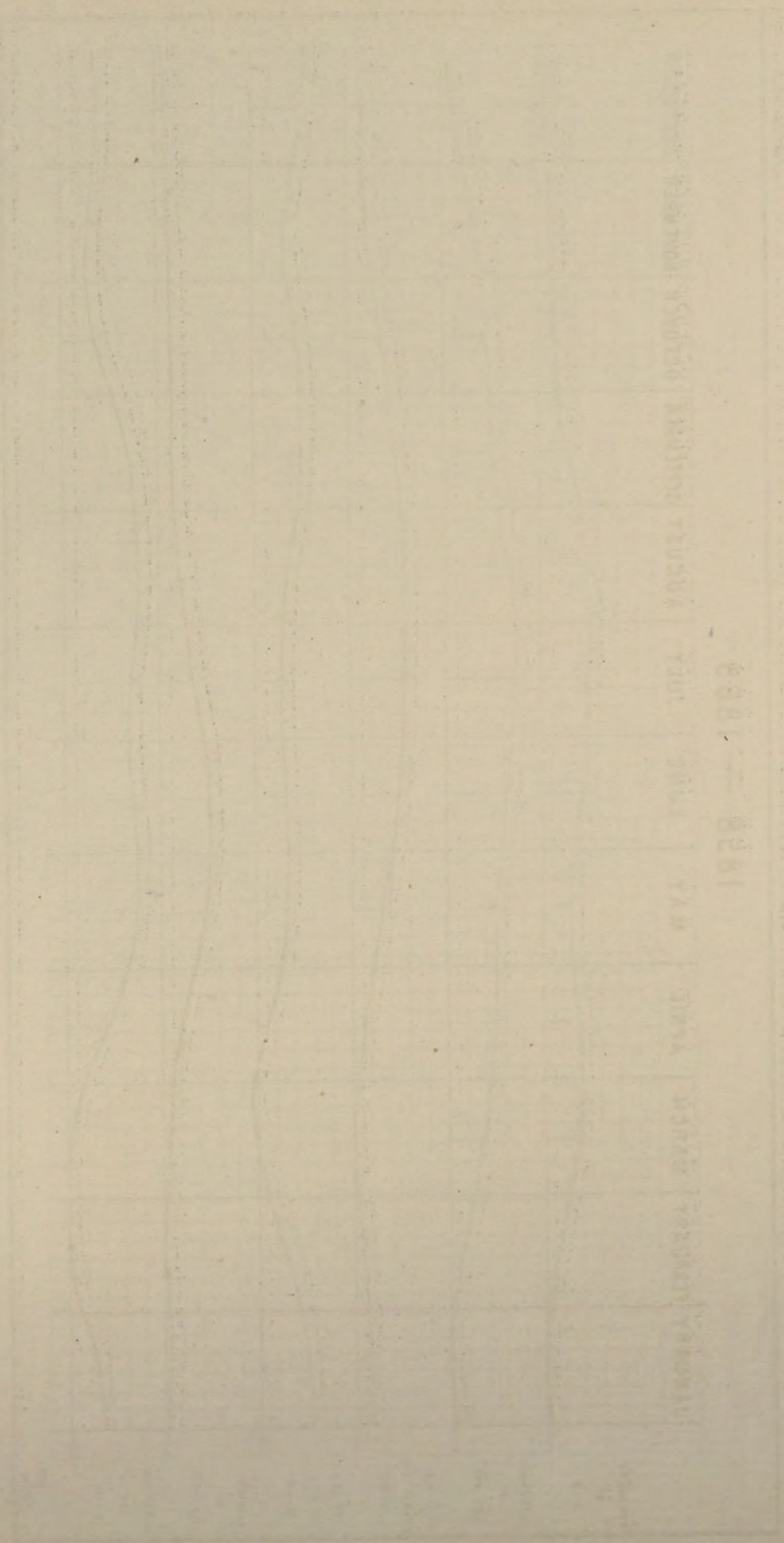
1858 — 1863



НОРМЫ ЛАВНИК ЭНТ ОНИВАНЕ-ЭЗВНОД

40

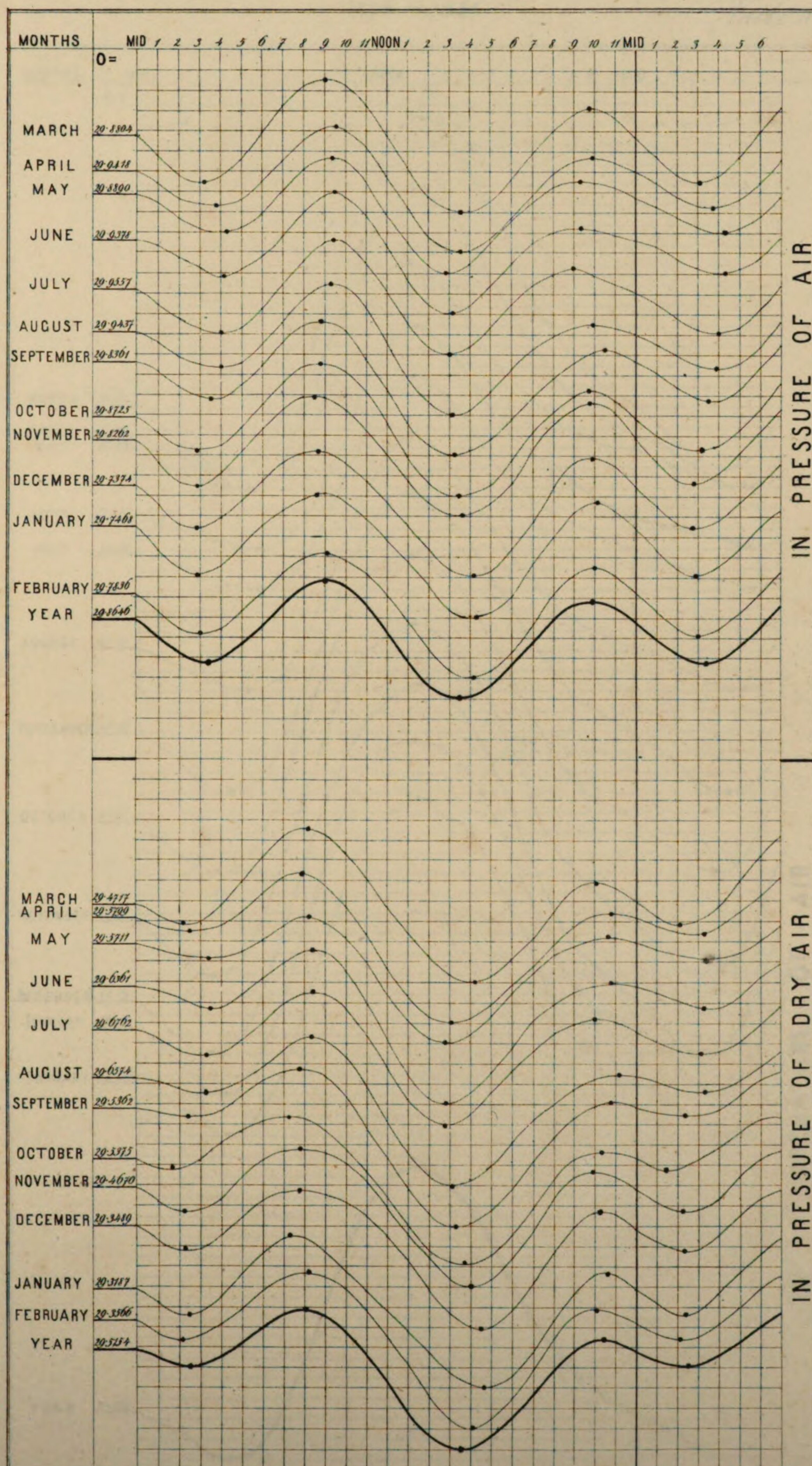
0001 — 8281



CURVES SHEWING THE HORARY VARIATIONS

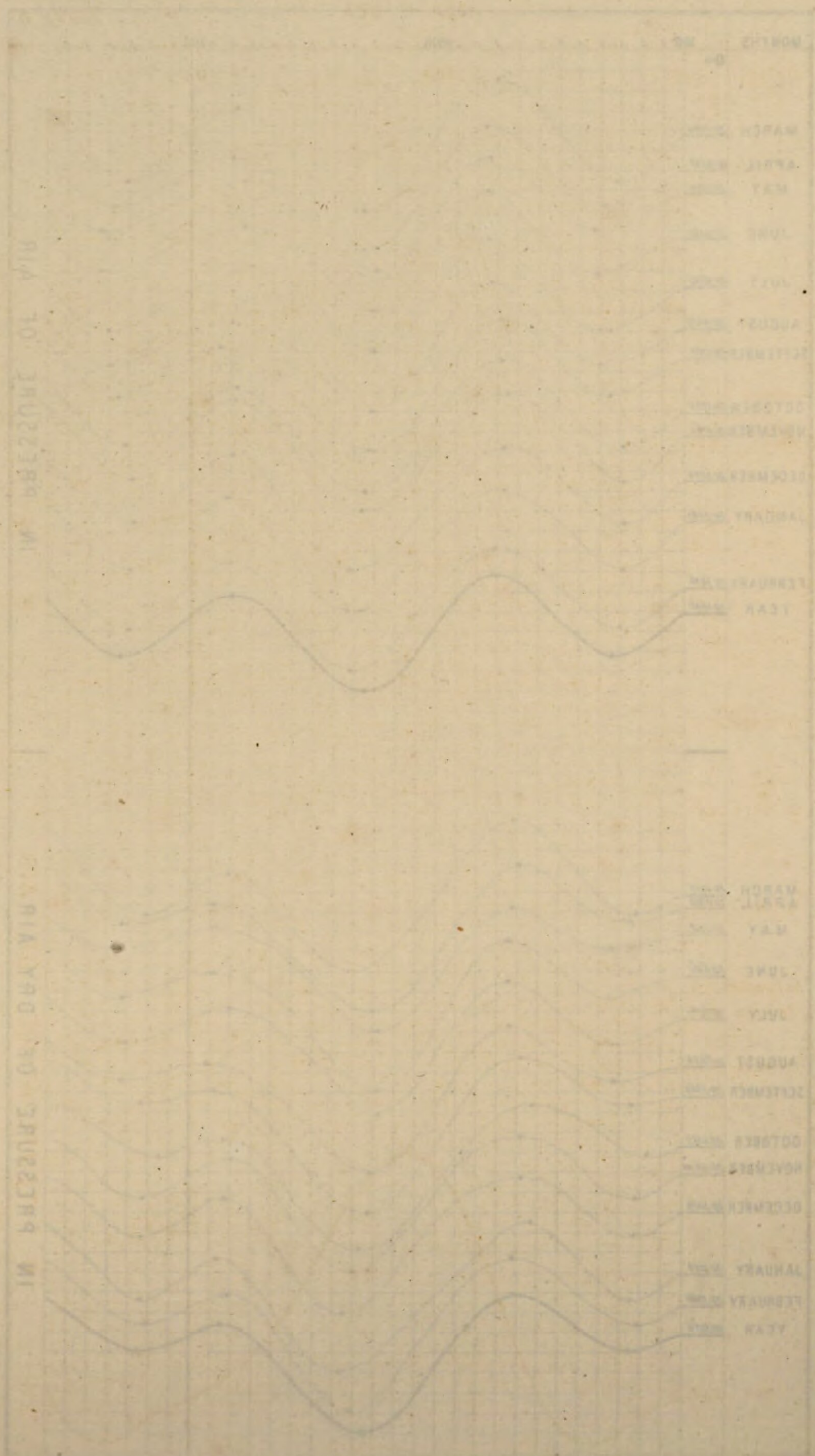
1858 — 1863

Table 5



CURVES SHOWING THE HOURLY VARIATIONS

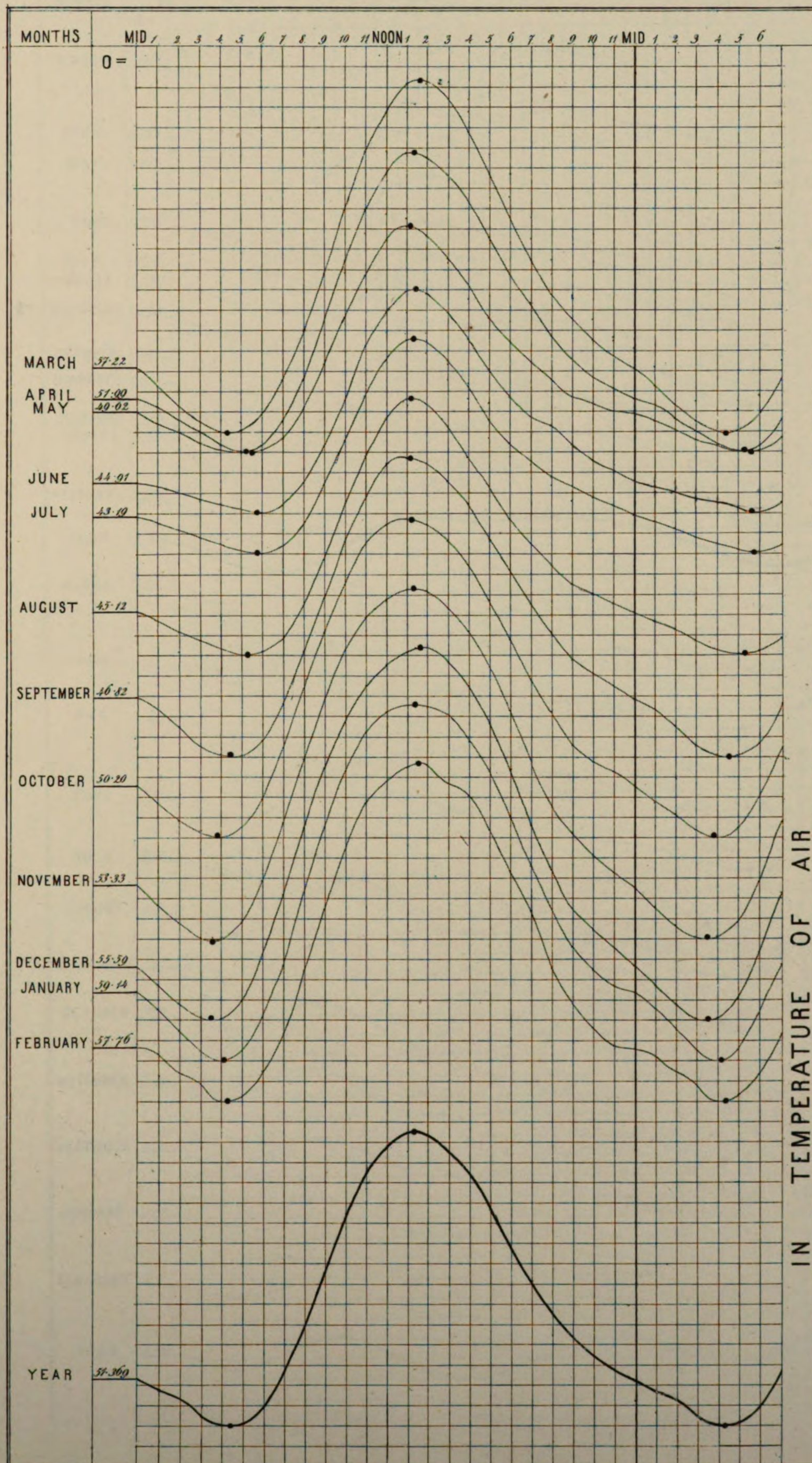
1888-1889



CURVES SHEWING THE HORARY VARIATIONS

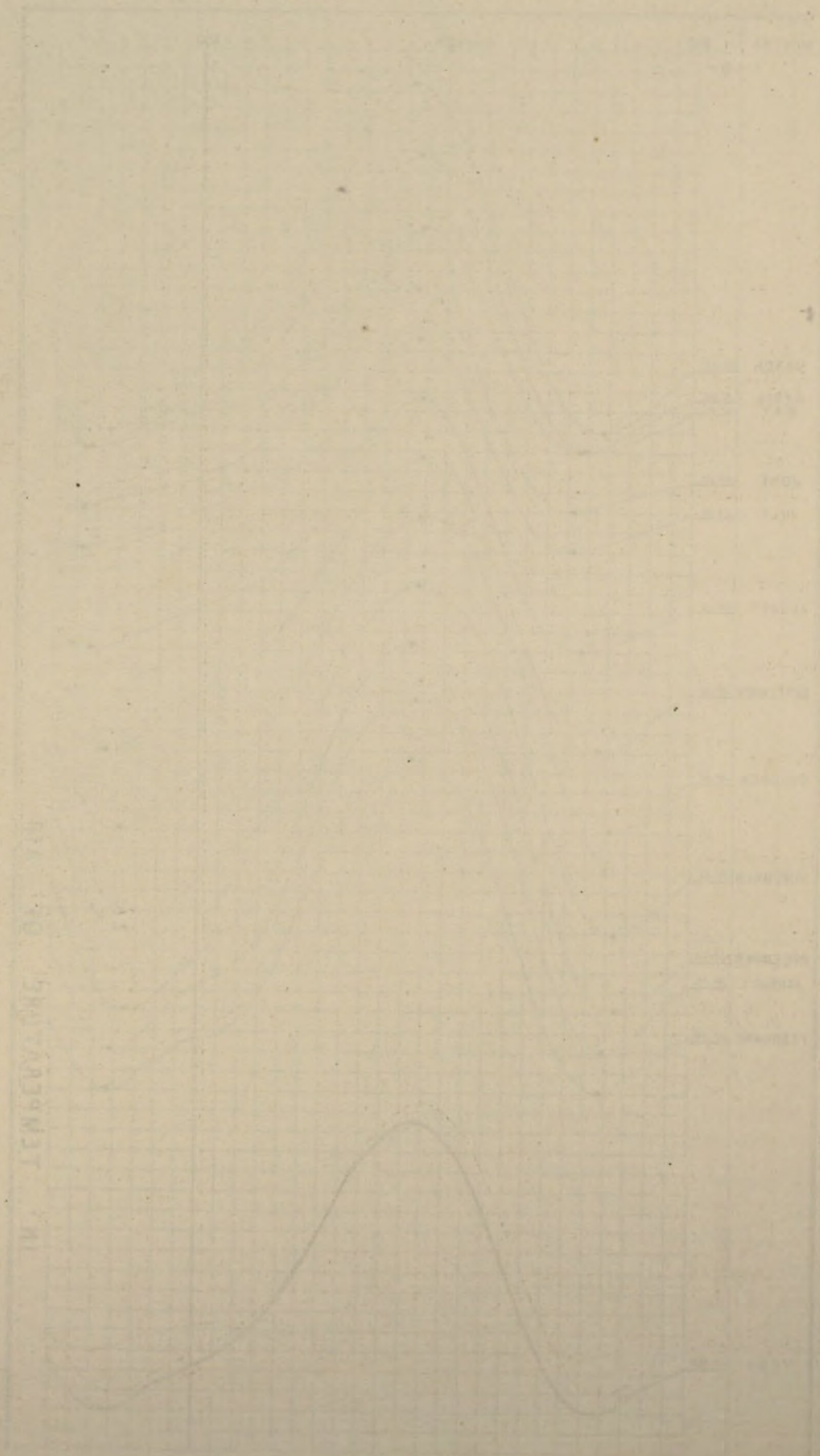
1858 — 1863

Table 6.



CONVERT SHEWING THE HOBART VARIATIONS

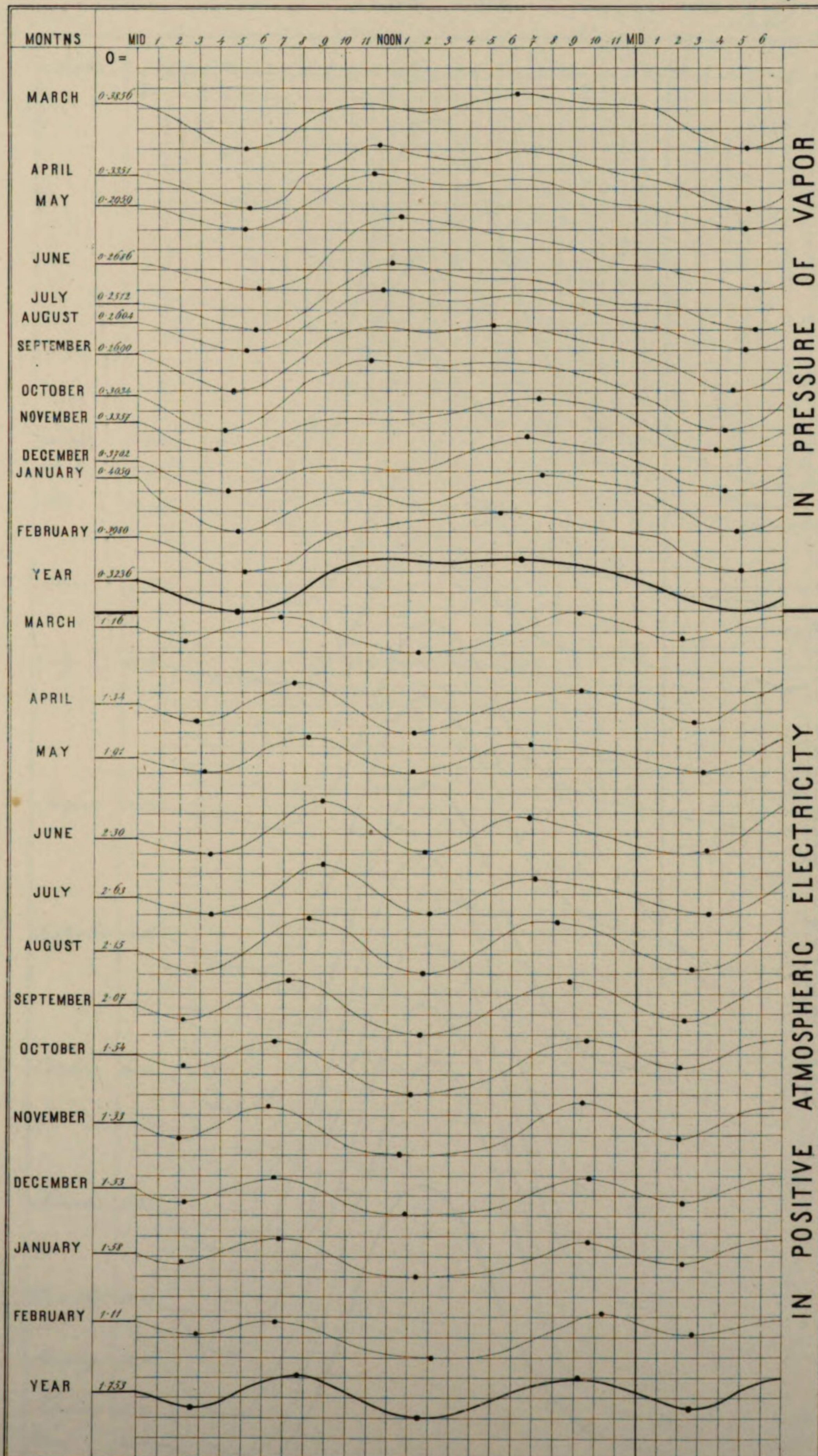
1922-1923



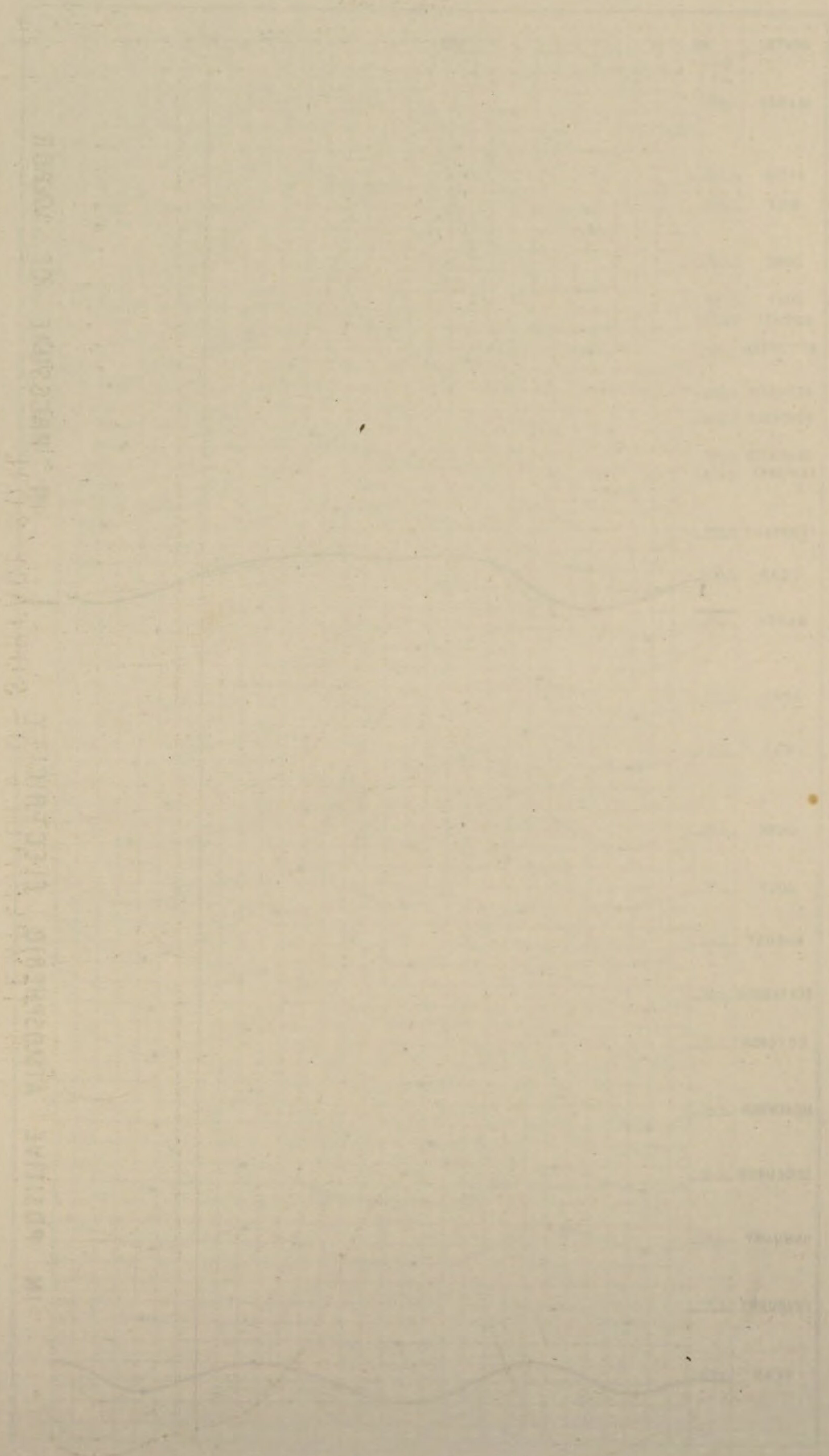
CURVES SHEWING THE HORARY VARIATIONS

1858—1863

Table 4



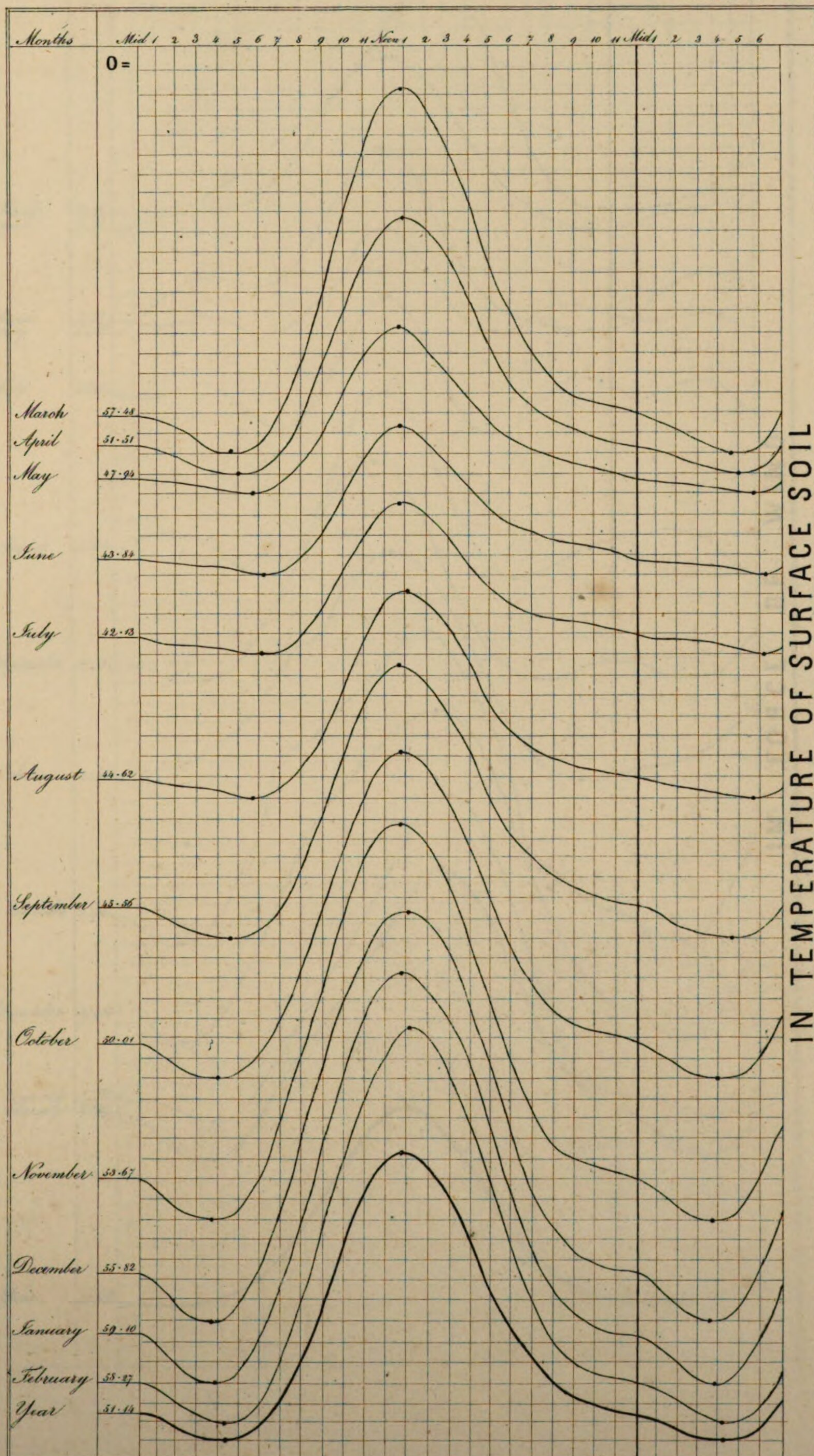
CURVES SHOWING THE HOBBY VARIATIONS



CURVES SHEWING THE HORARY VARIATIONS

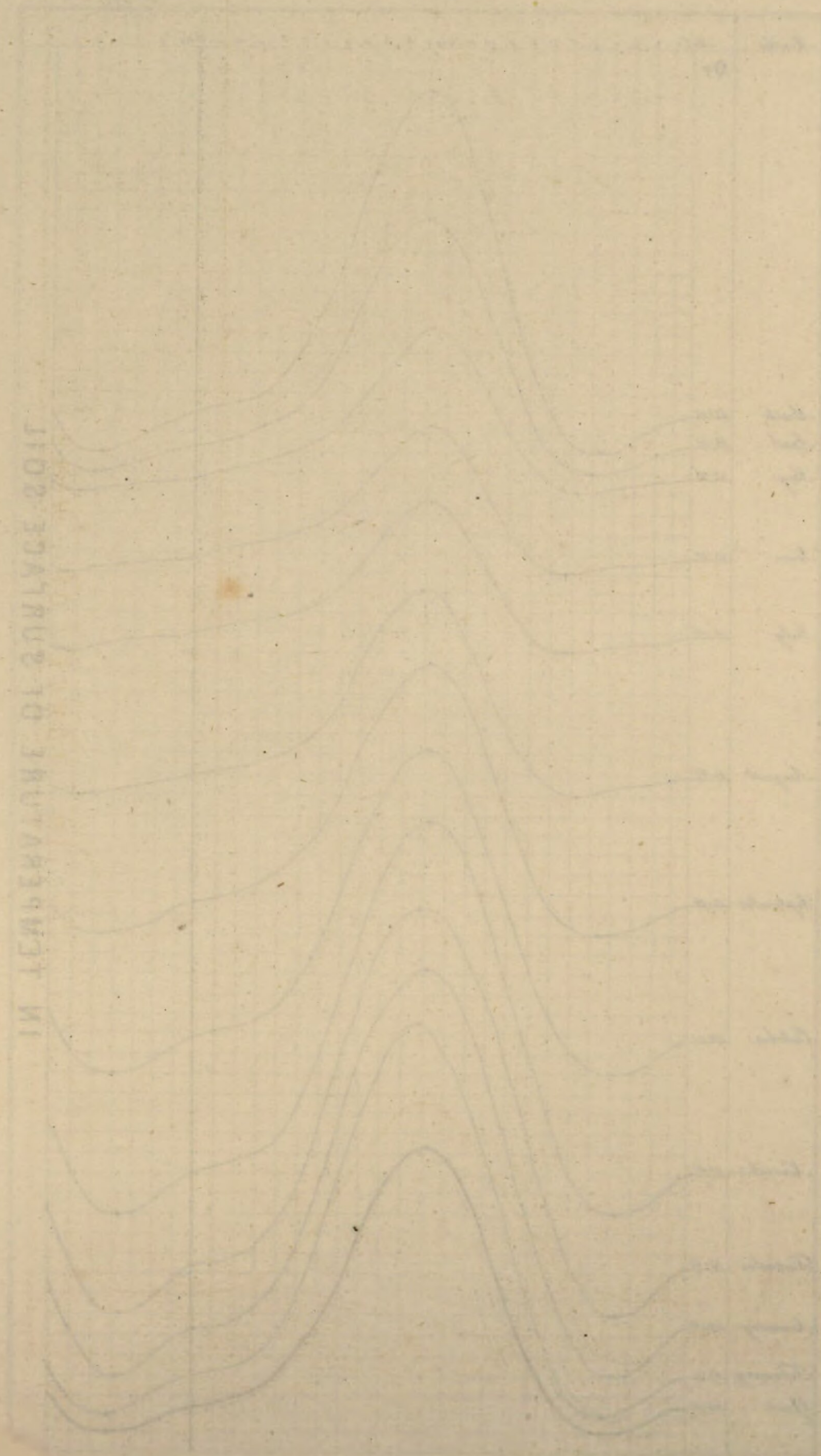
1858 — 1863

Table 8.



CURVES SHOWING THE HOURLY VARIATIONS

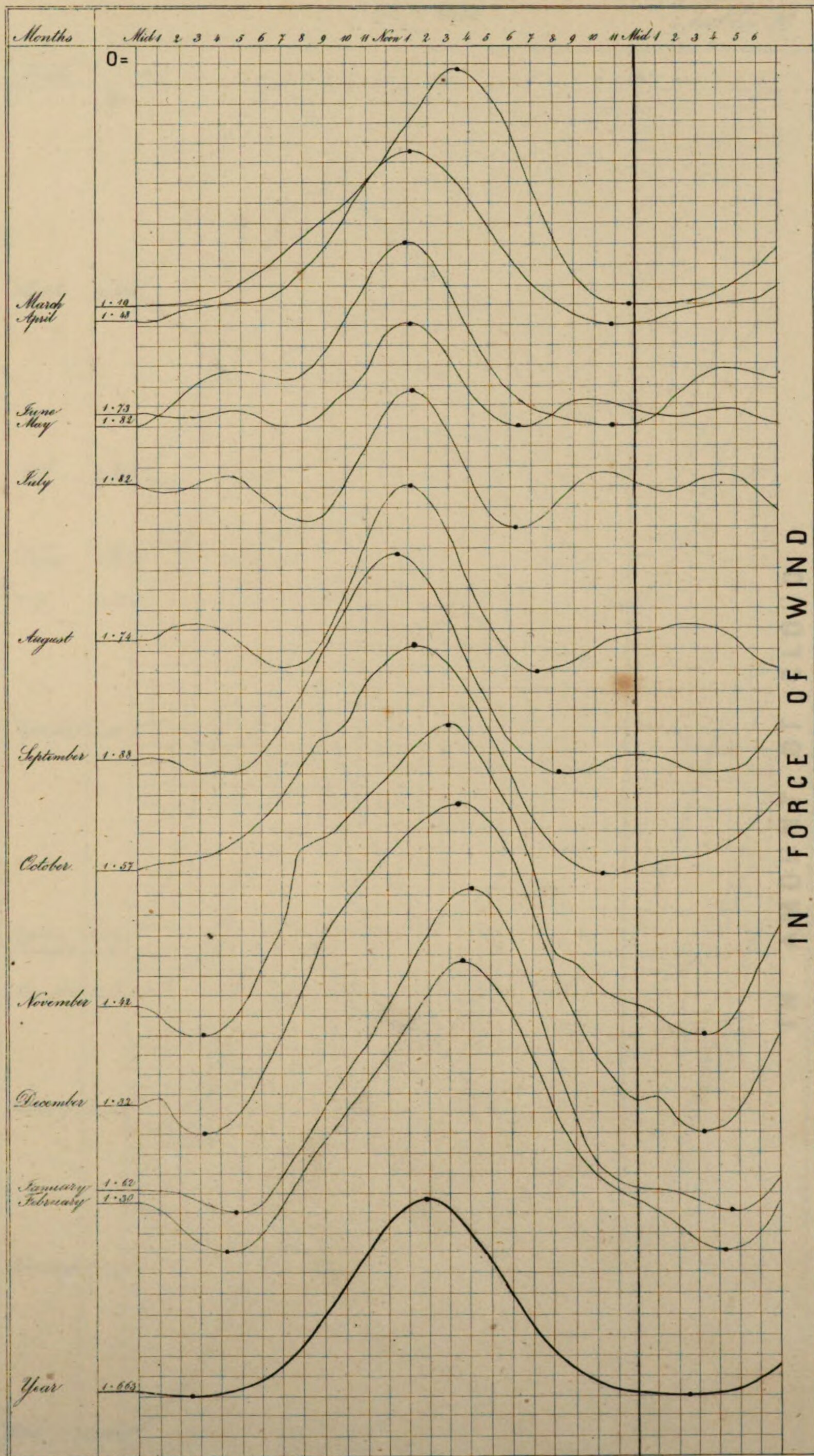
1904 - 1905



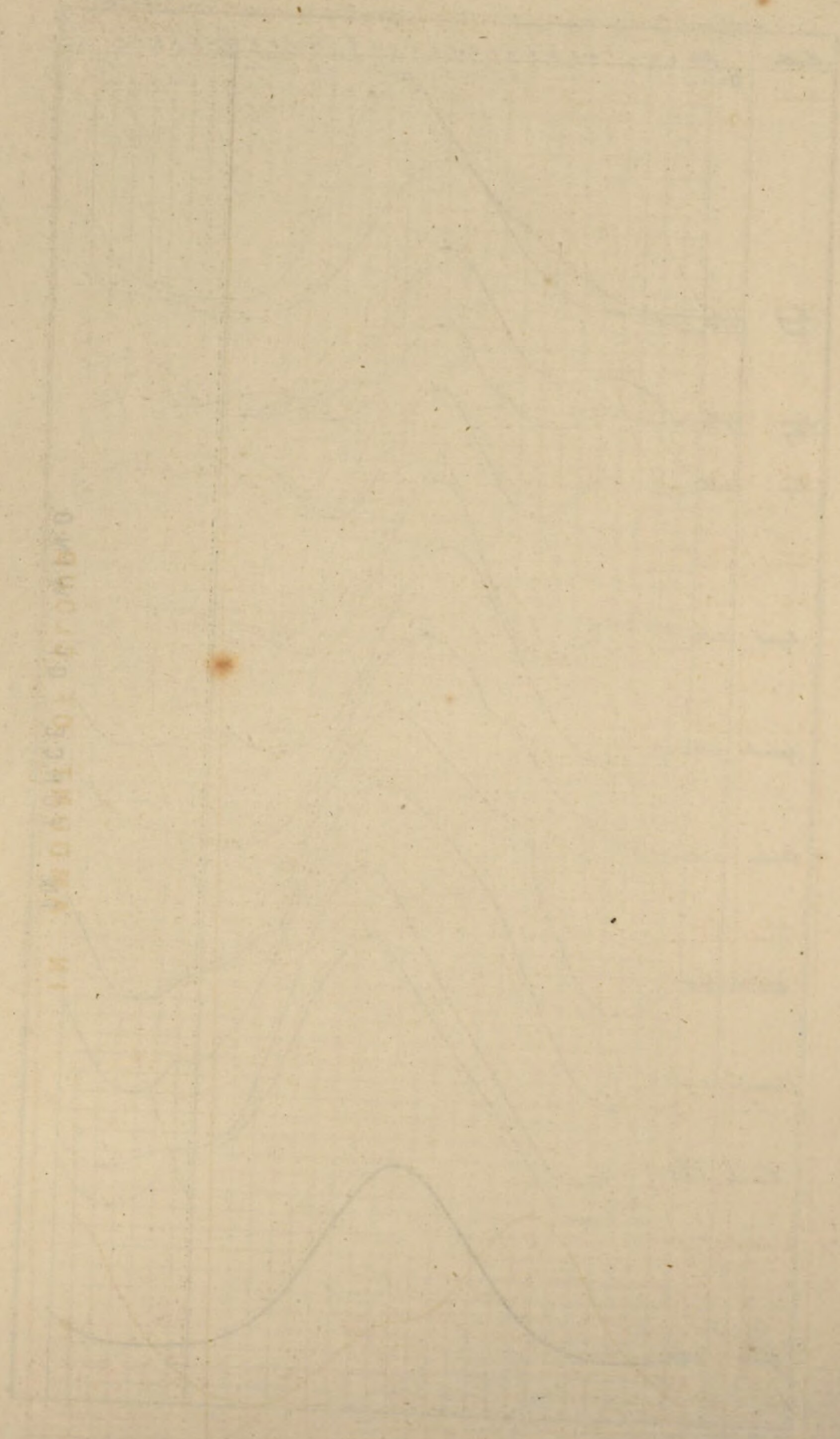
CURVES SHEWING THE HORARY VARIATIONS

1858 - 1863

Table 9.



CURVES SHOWING THE MONTHLY VARIATIONS
IN THE TEMPERATURE OF THE AIR

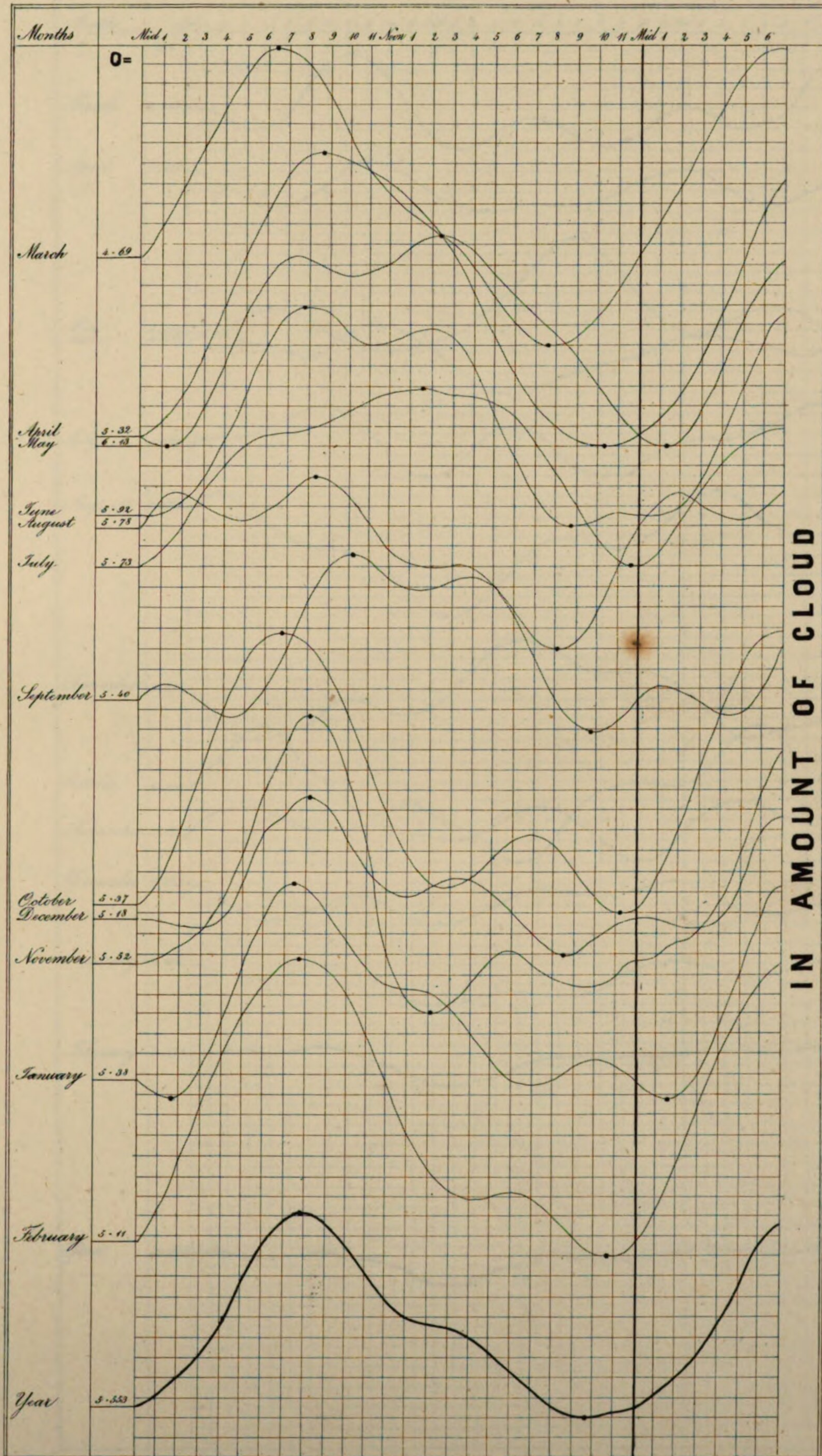


TEMPERATURE OF THE AIR

CURVES SHEWING THE HORARY VARIATIONS

1858—1863

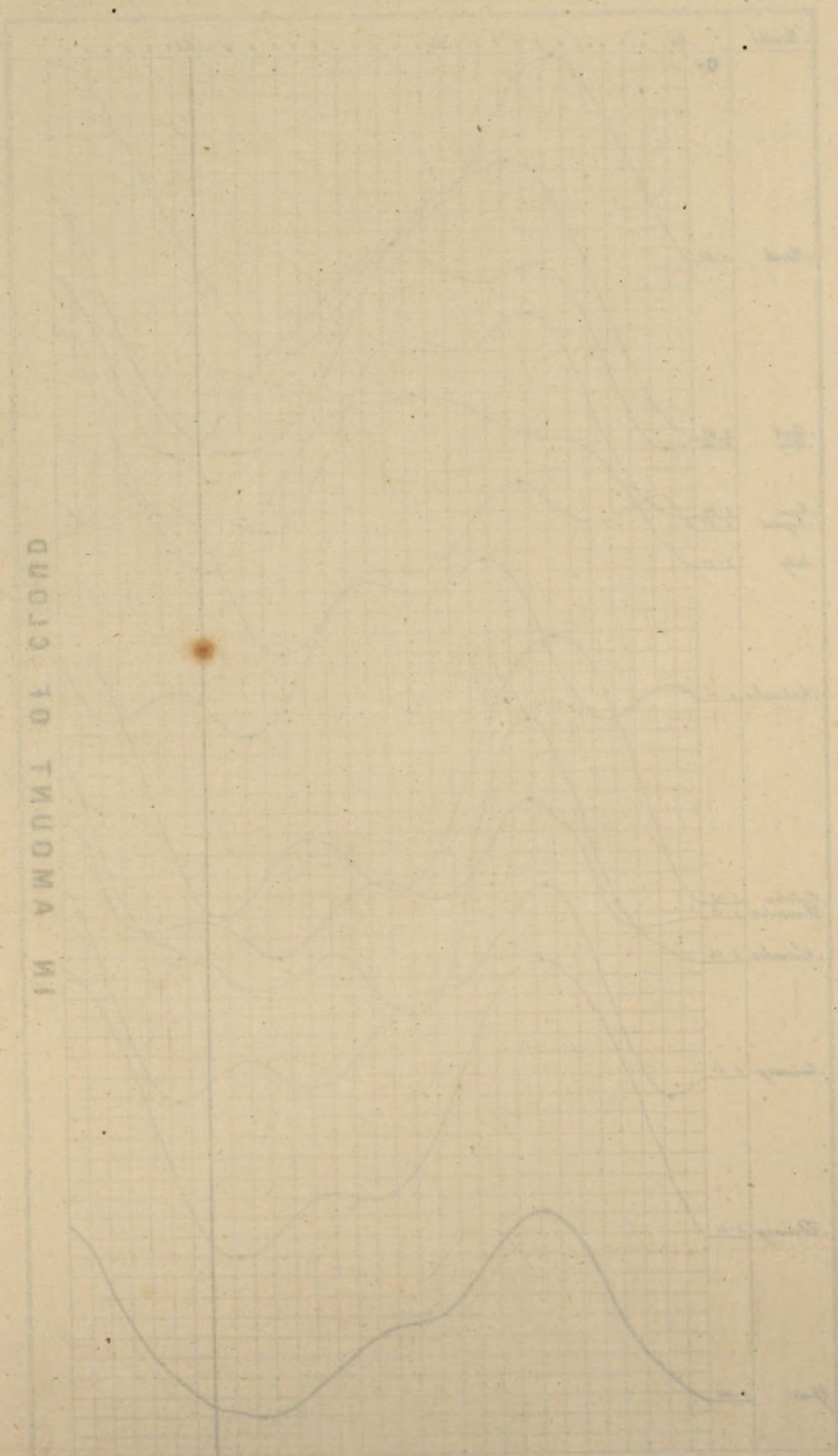
Table 10



CURVES SHOWING THE HOURLY VARIATIONS

1888-1889

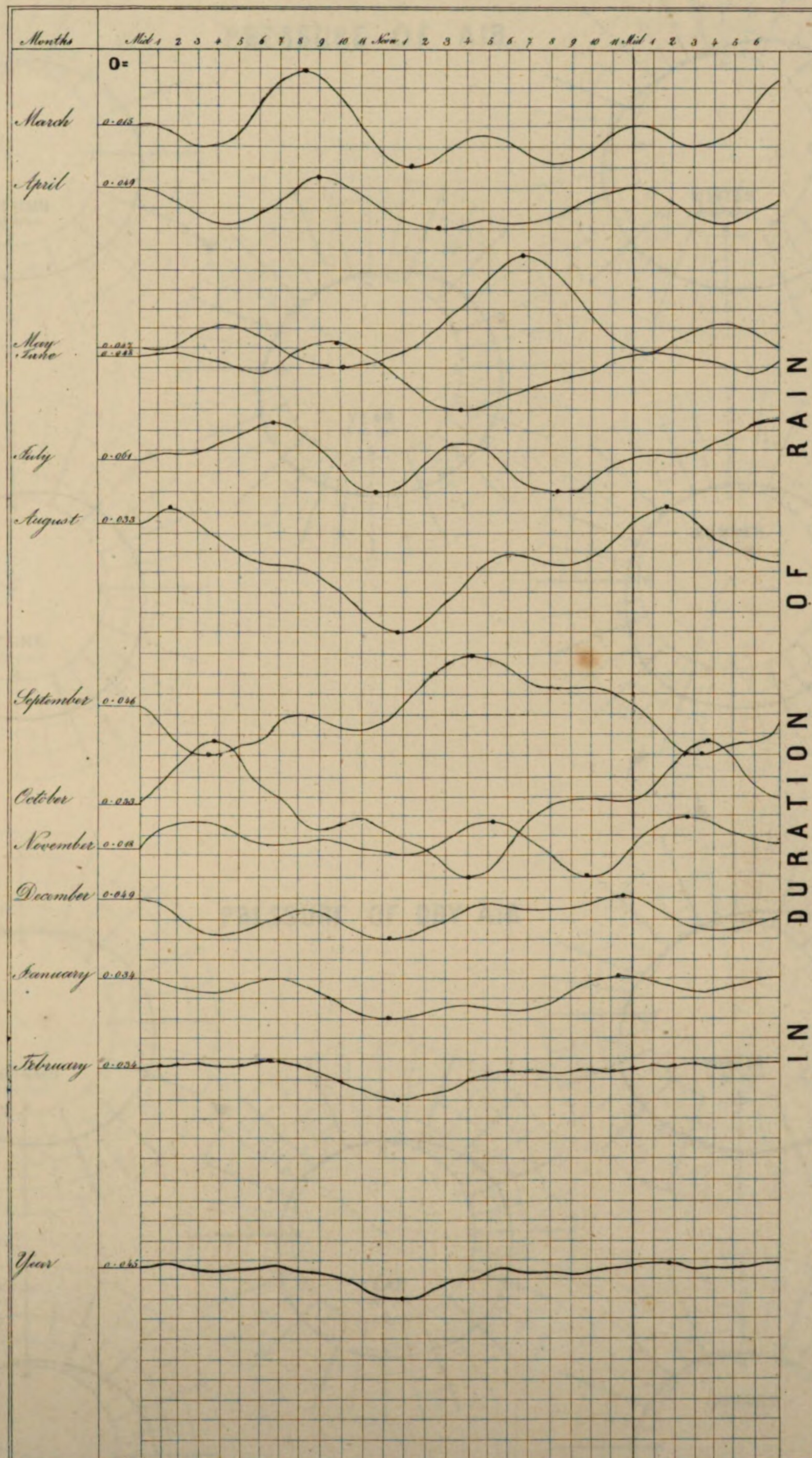
QUANTITY OF CLOUD



CURVES SHEWING THE HORARY VARIATIONS

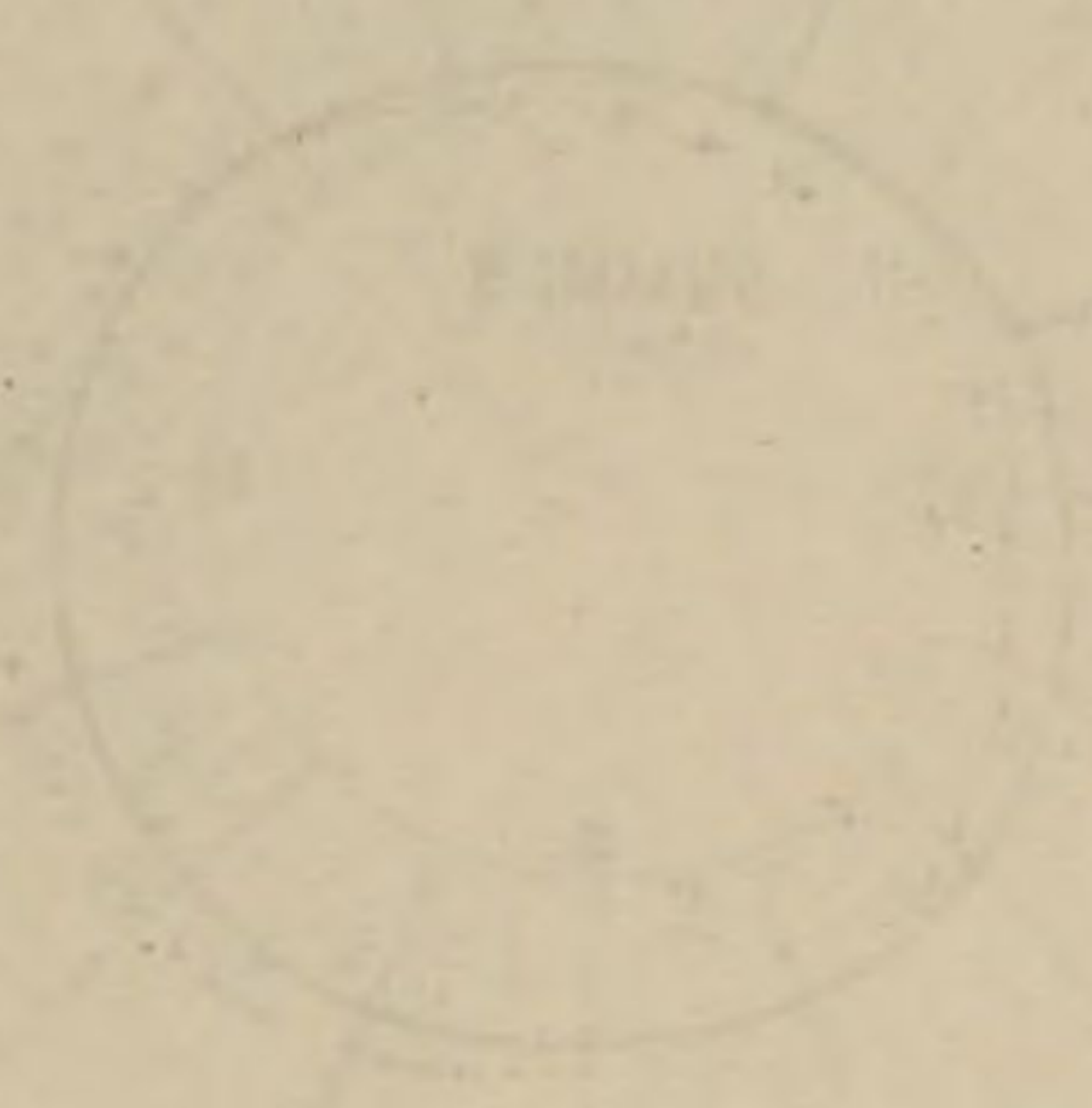
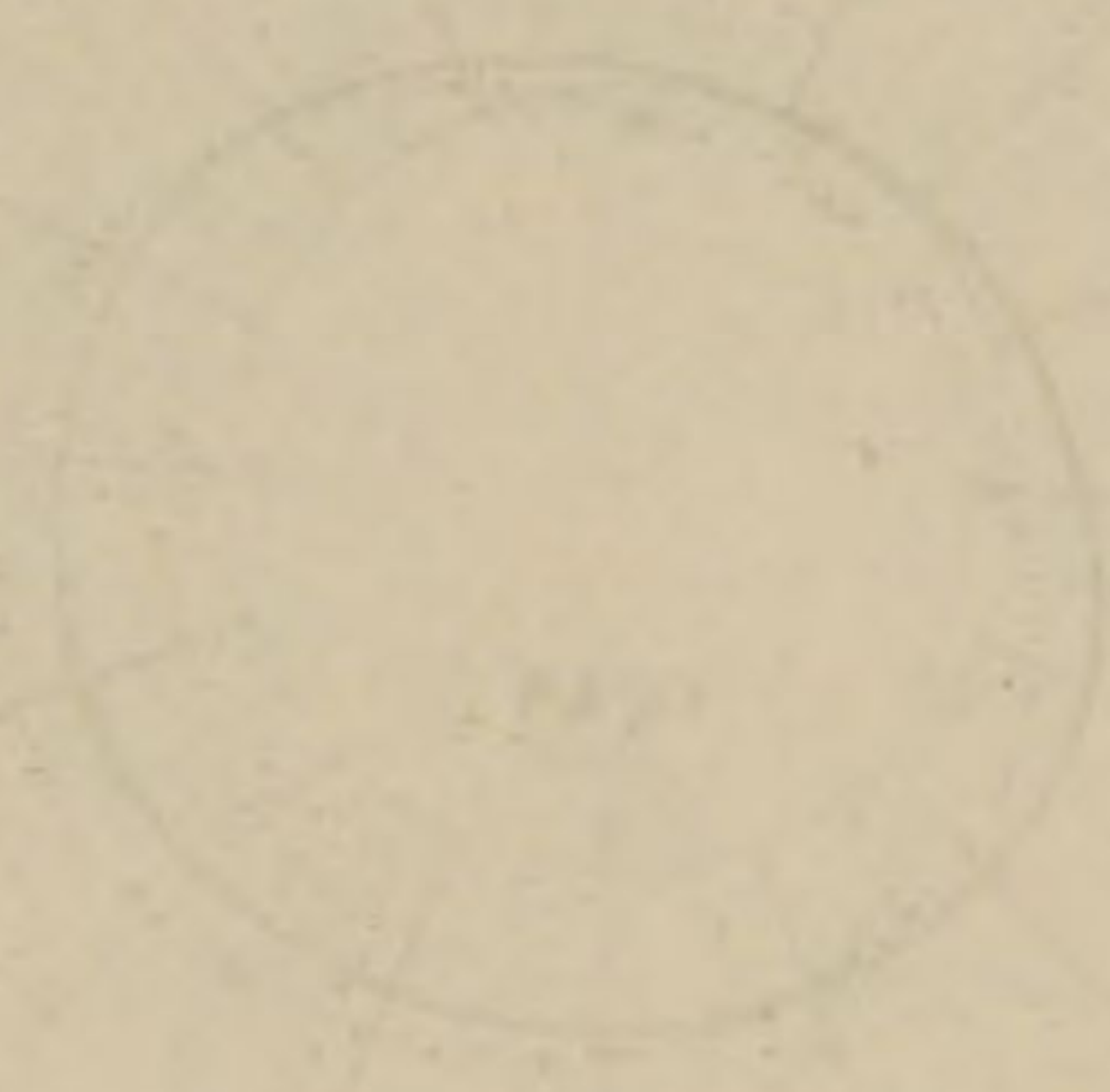
1858 - 1863

Table 11.

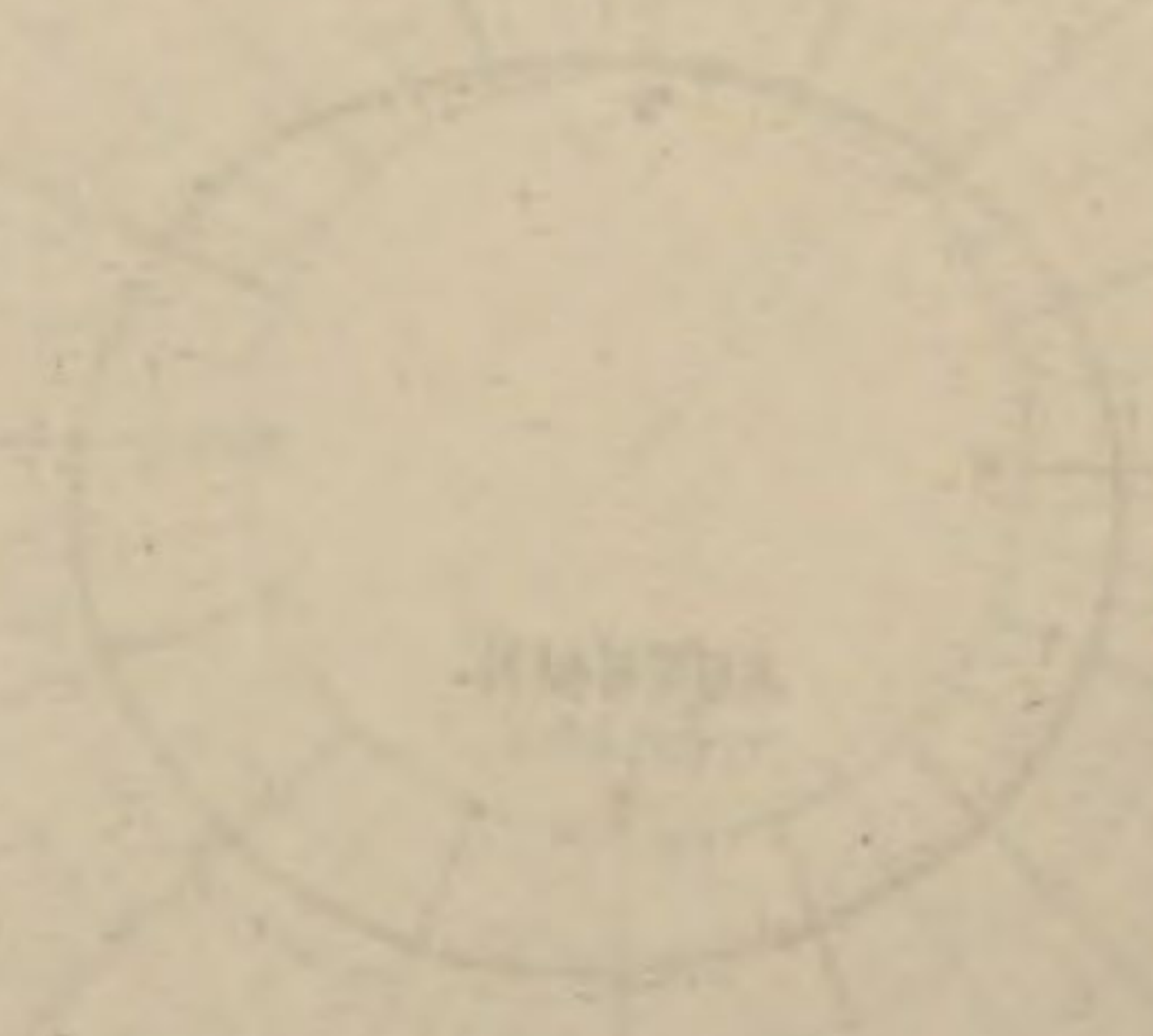


WINDY - 10/11/11

98522389 07-11-11



98522389 07-11-11

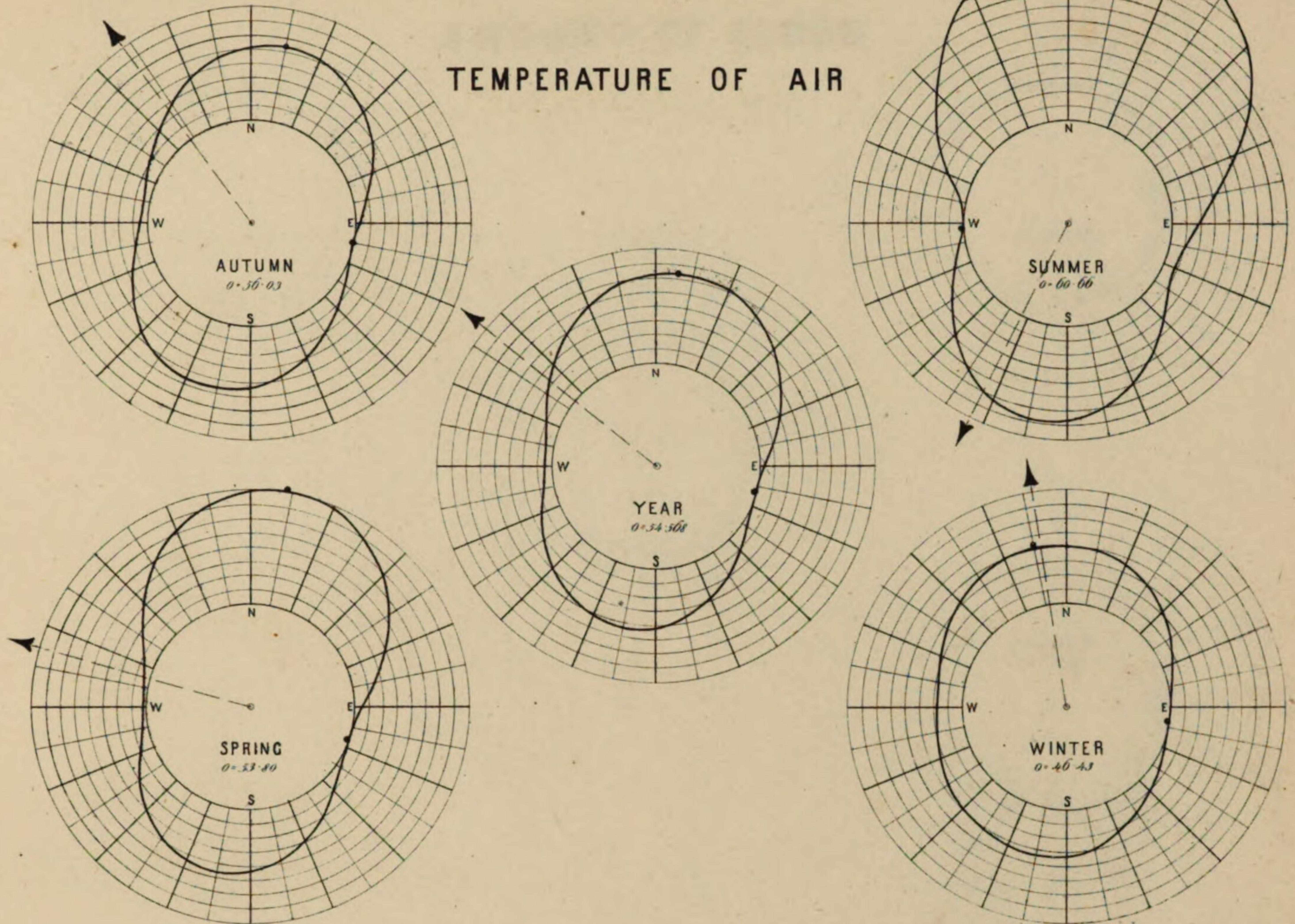


WIND — ROSES

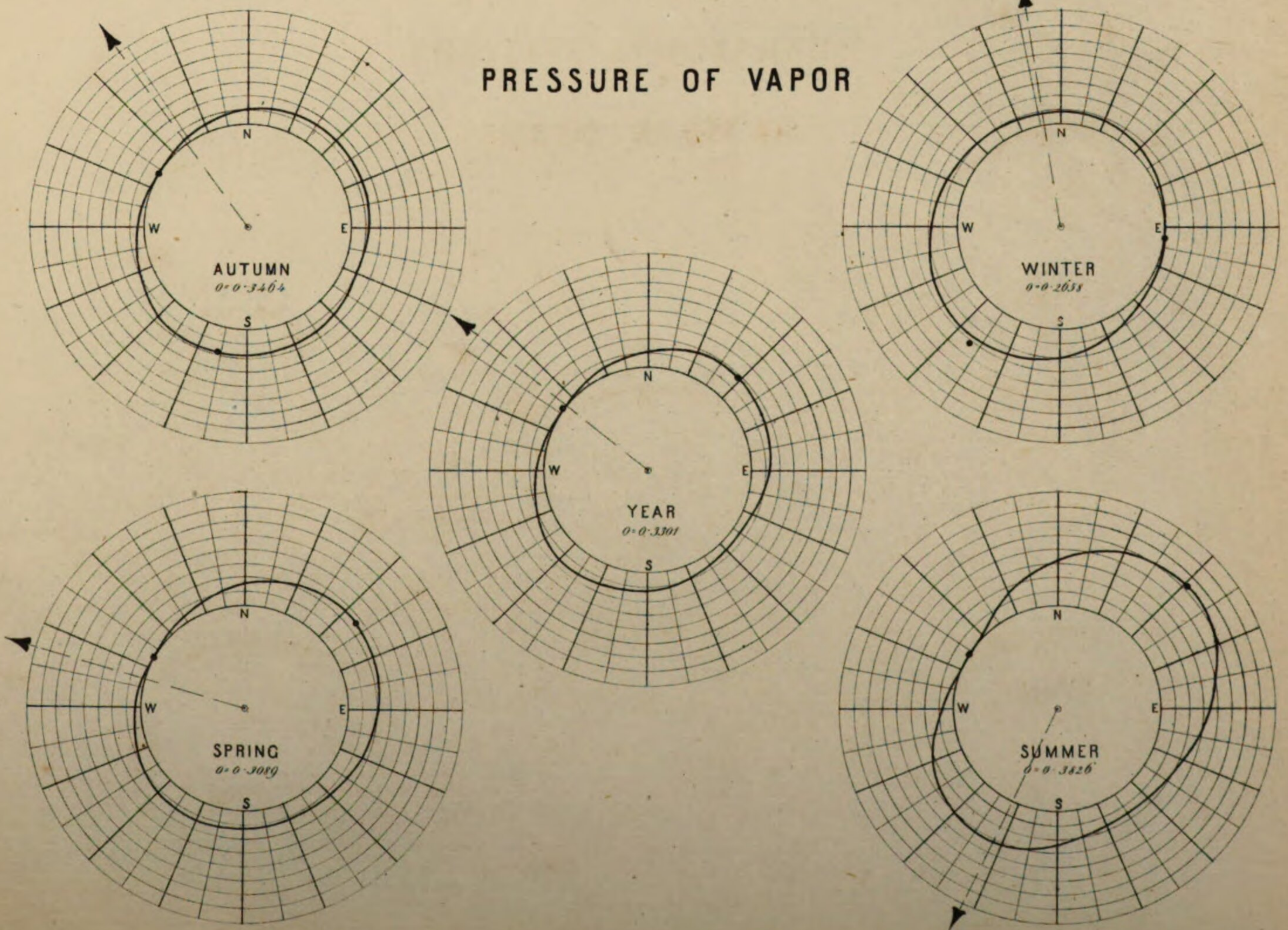
1858 — 1863

Table 13.

TEMPERATURE OF AIR



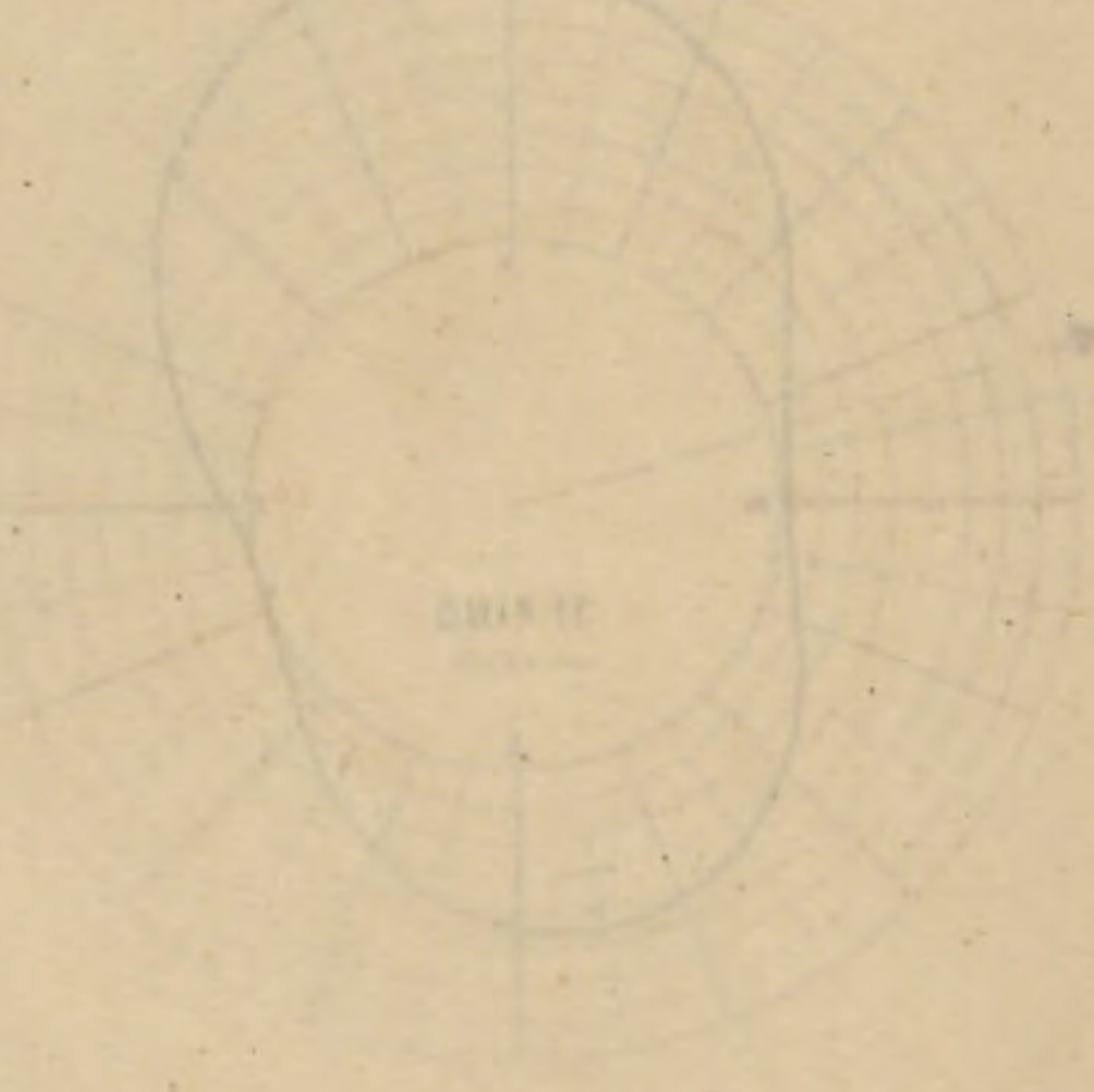
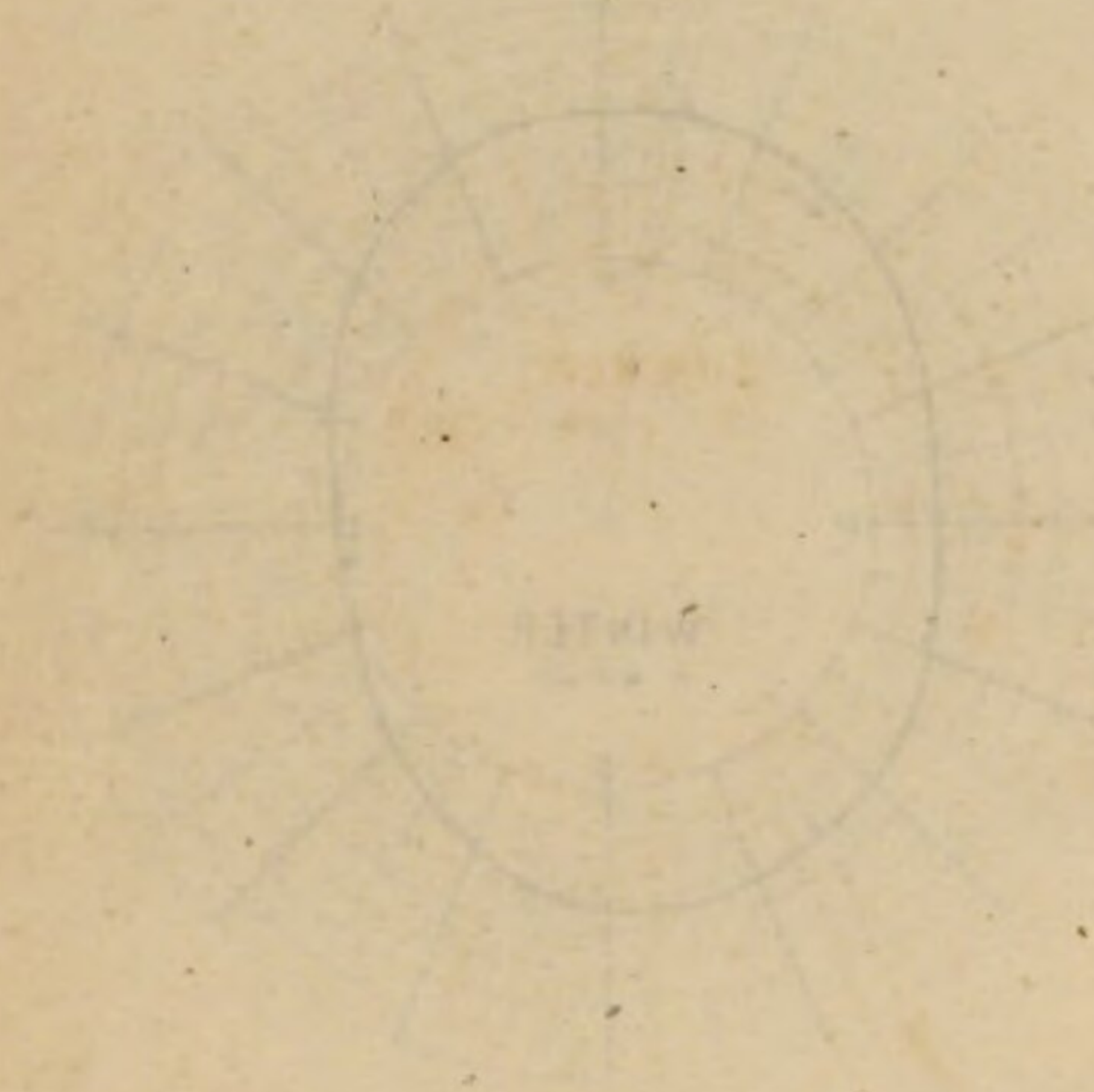
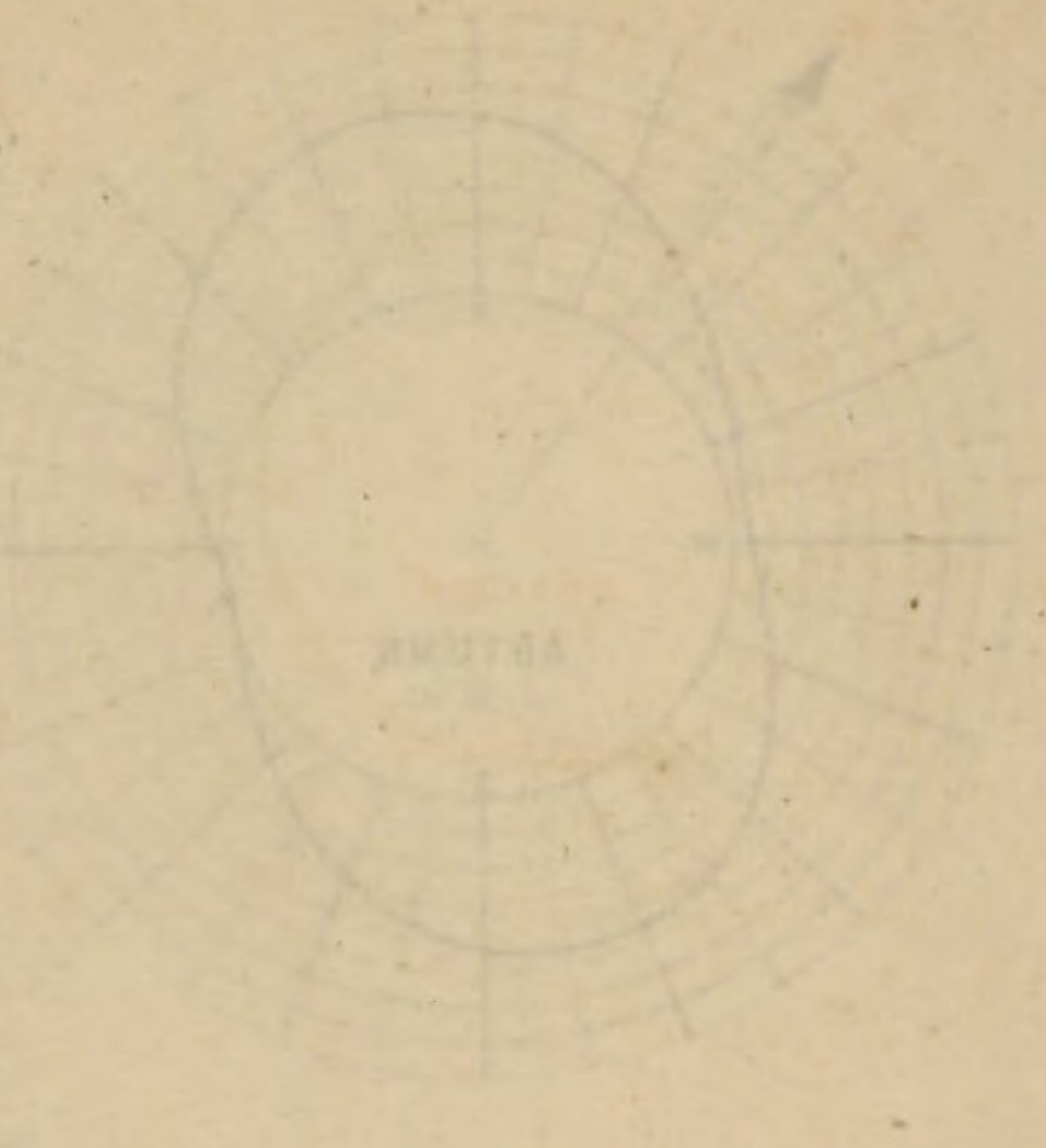
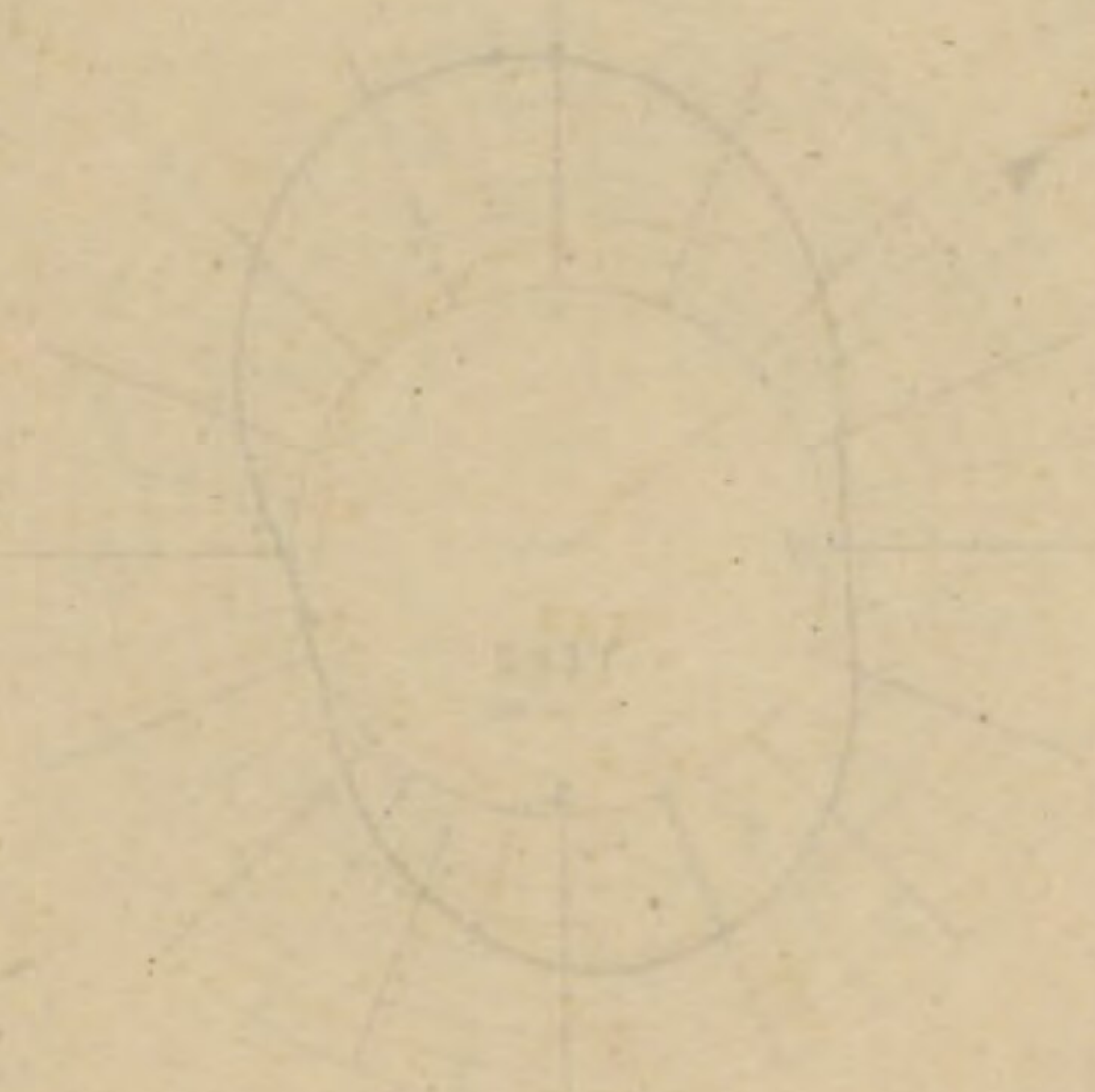
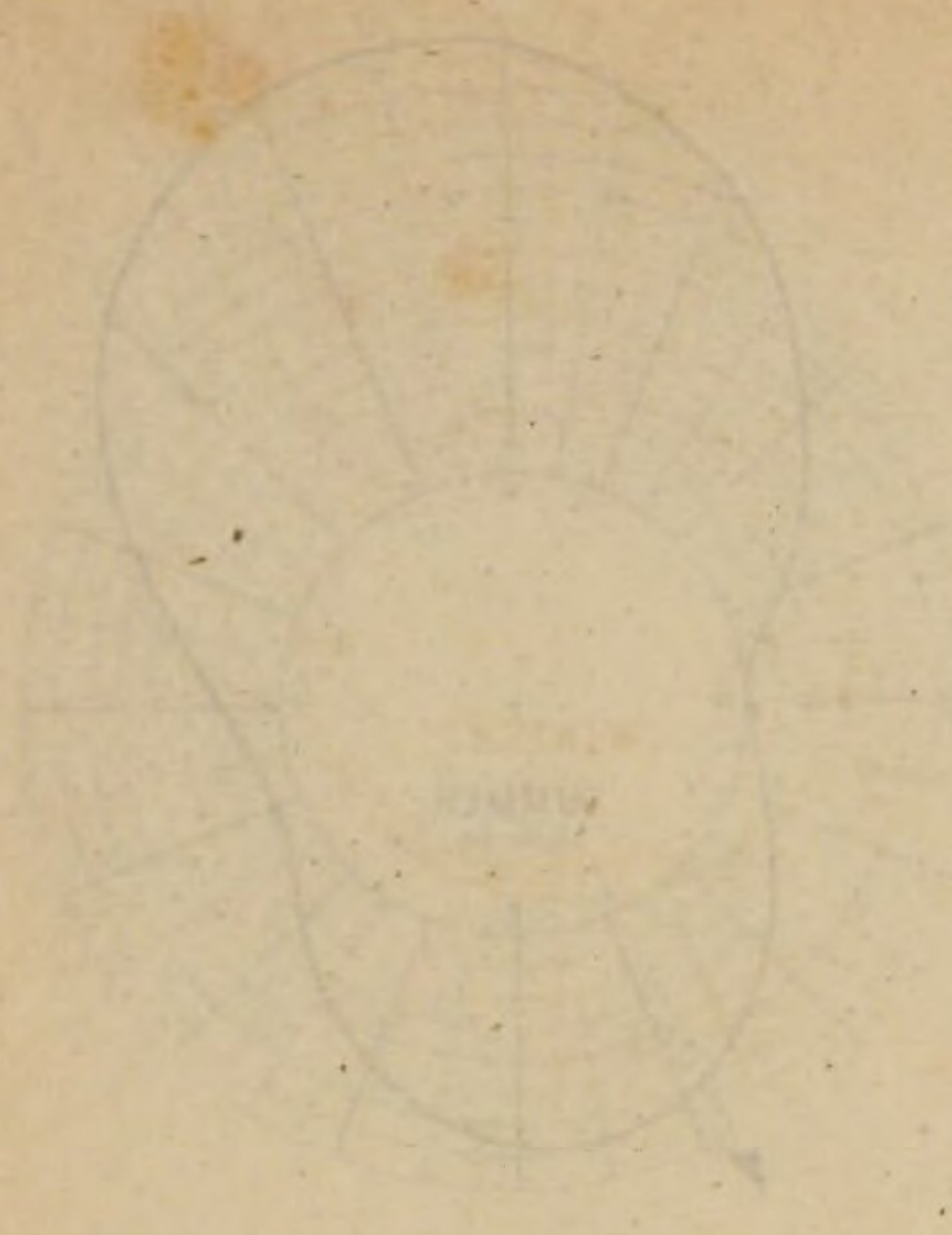
PRESSURE OF VAPOR



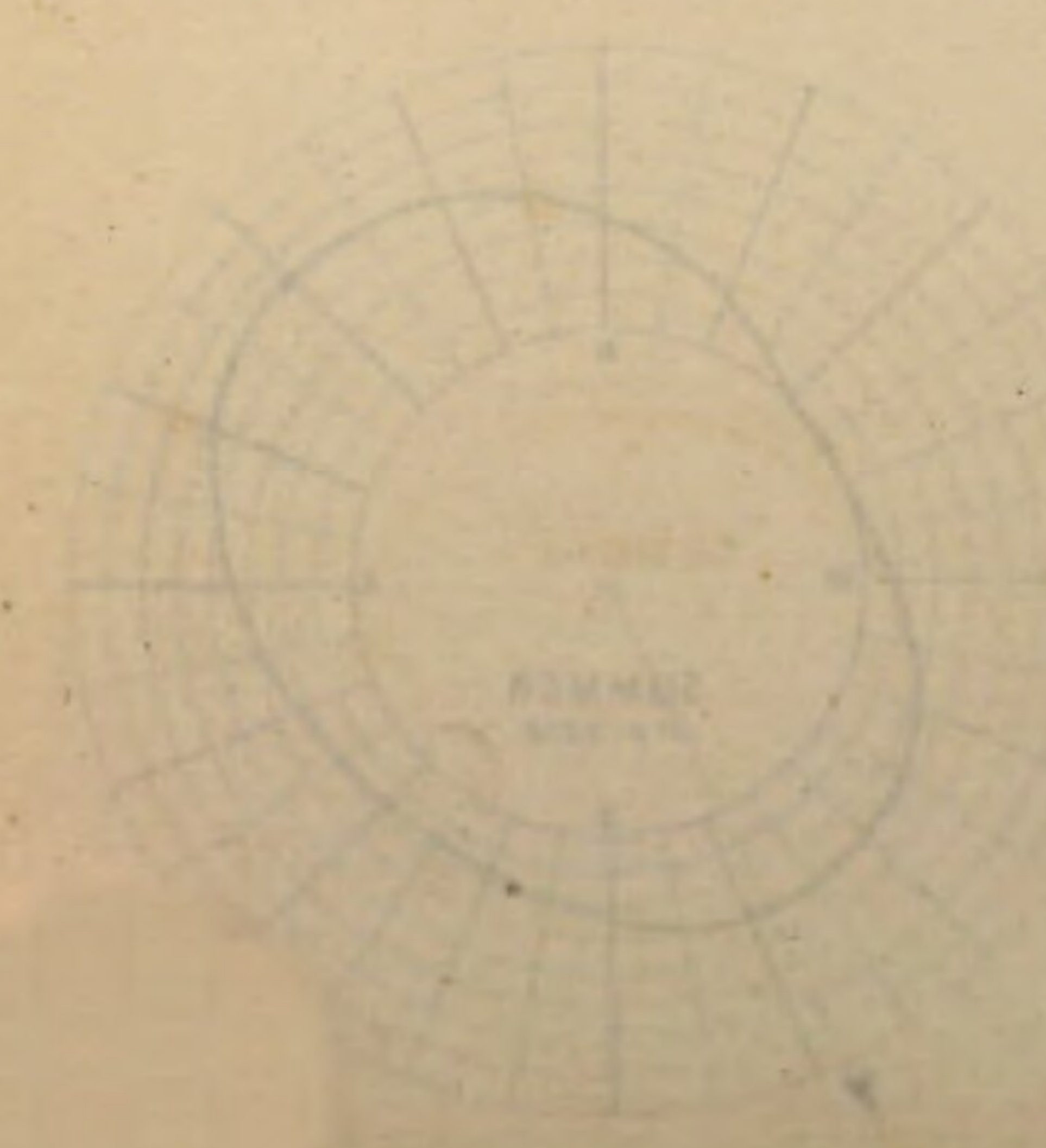
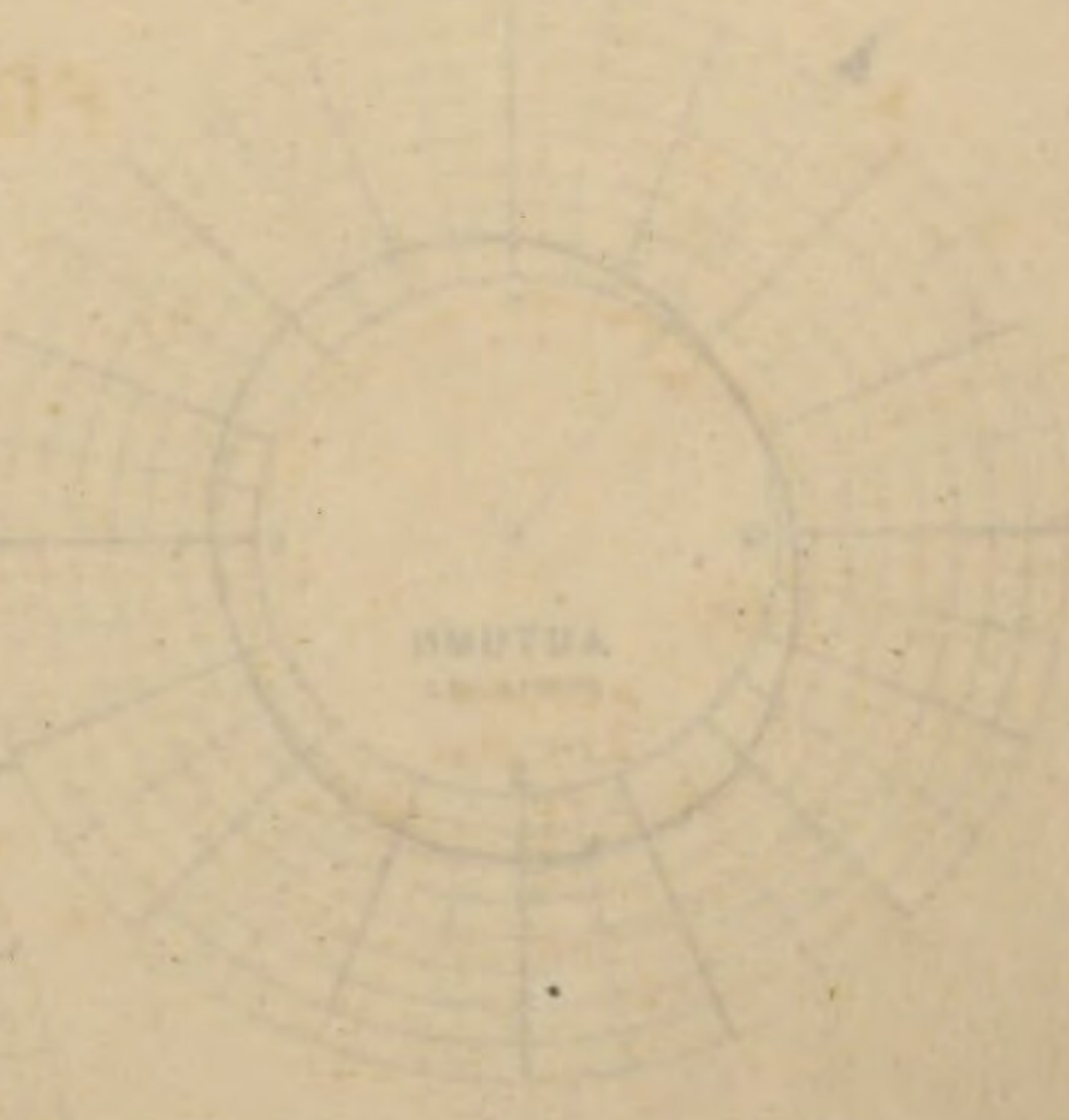
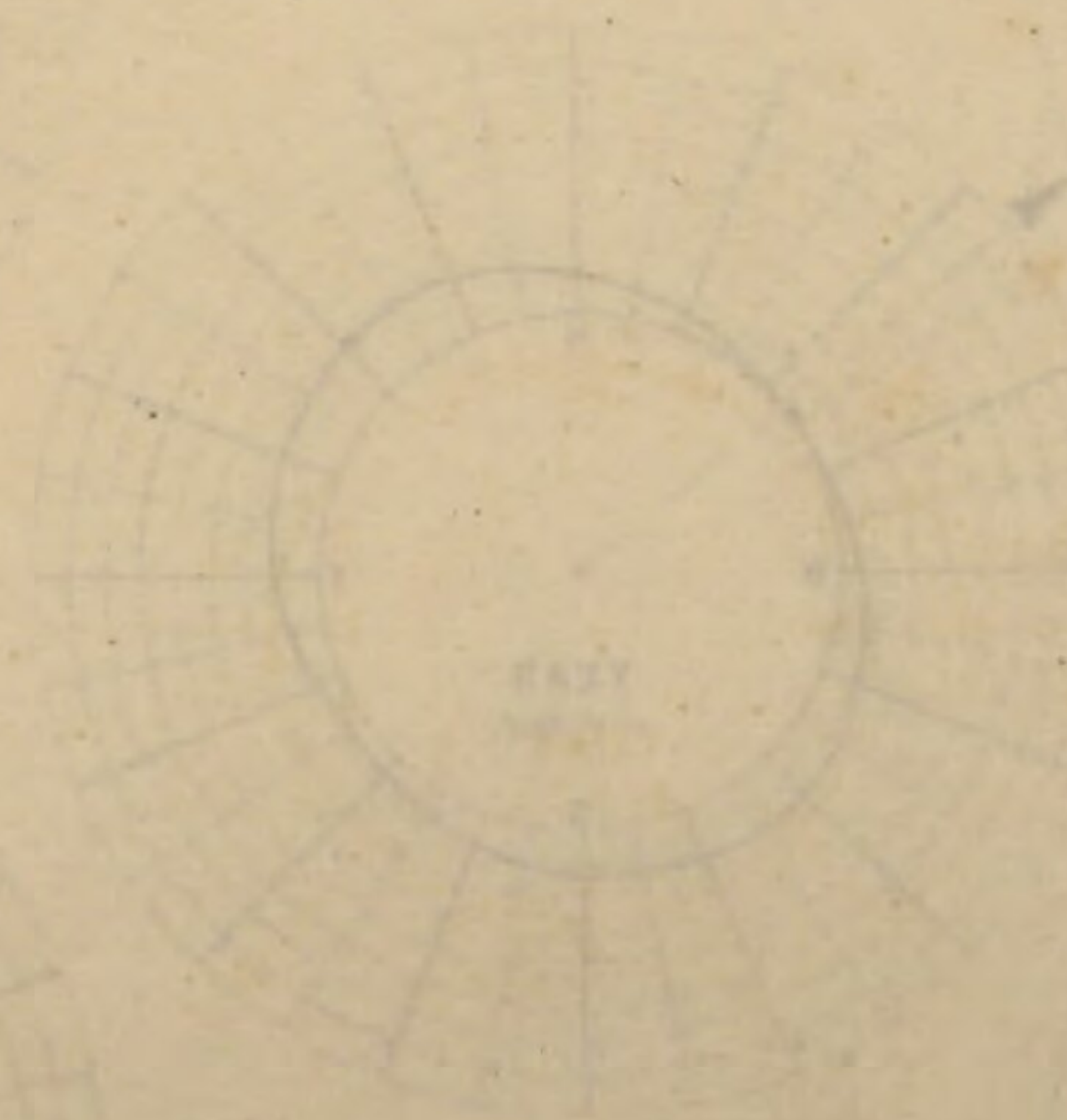
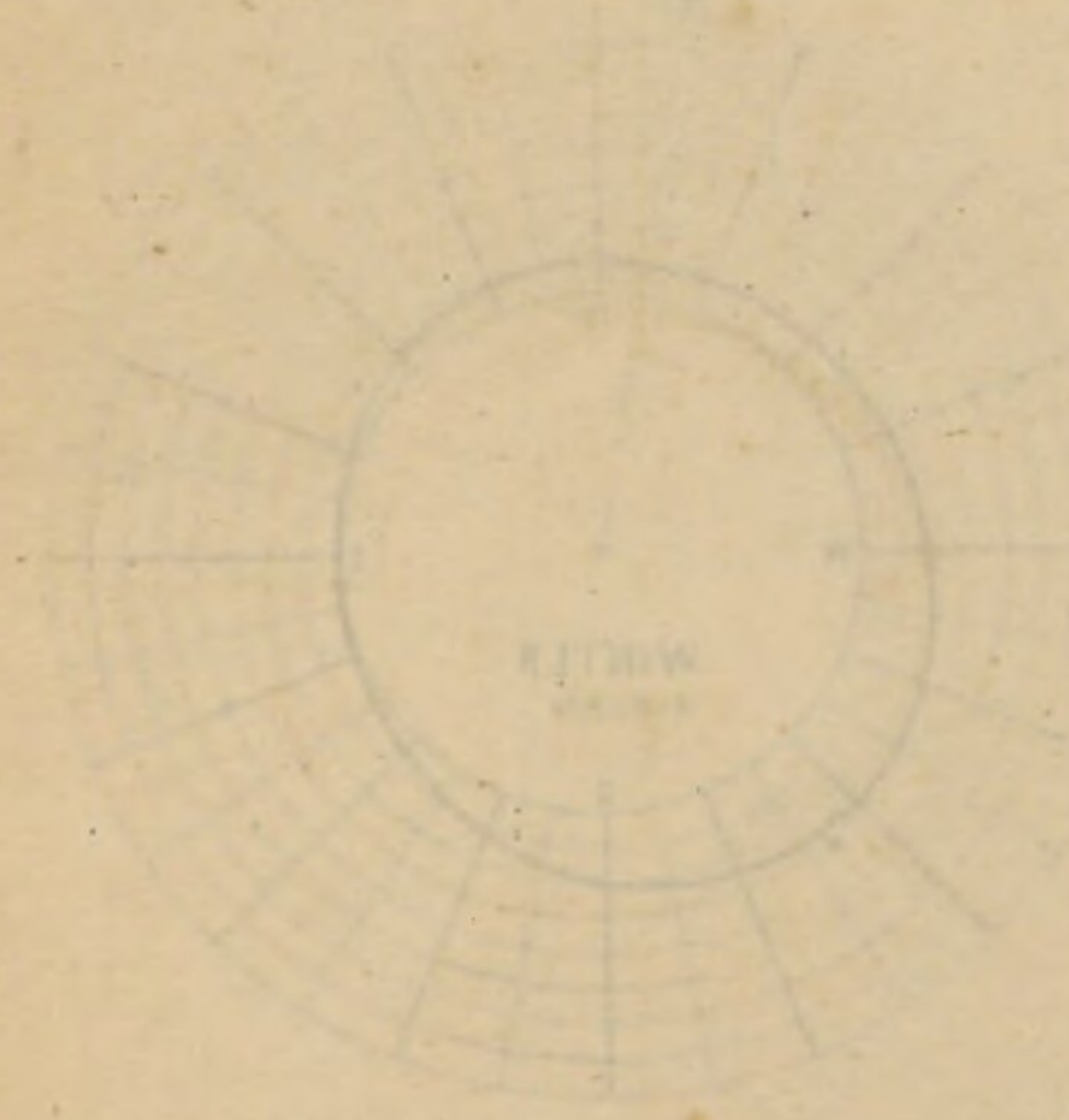
WIND-ROSE

1828-1863

TEMPERATURE OF AIR



RELATIVE HUMIDITY

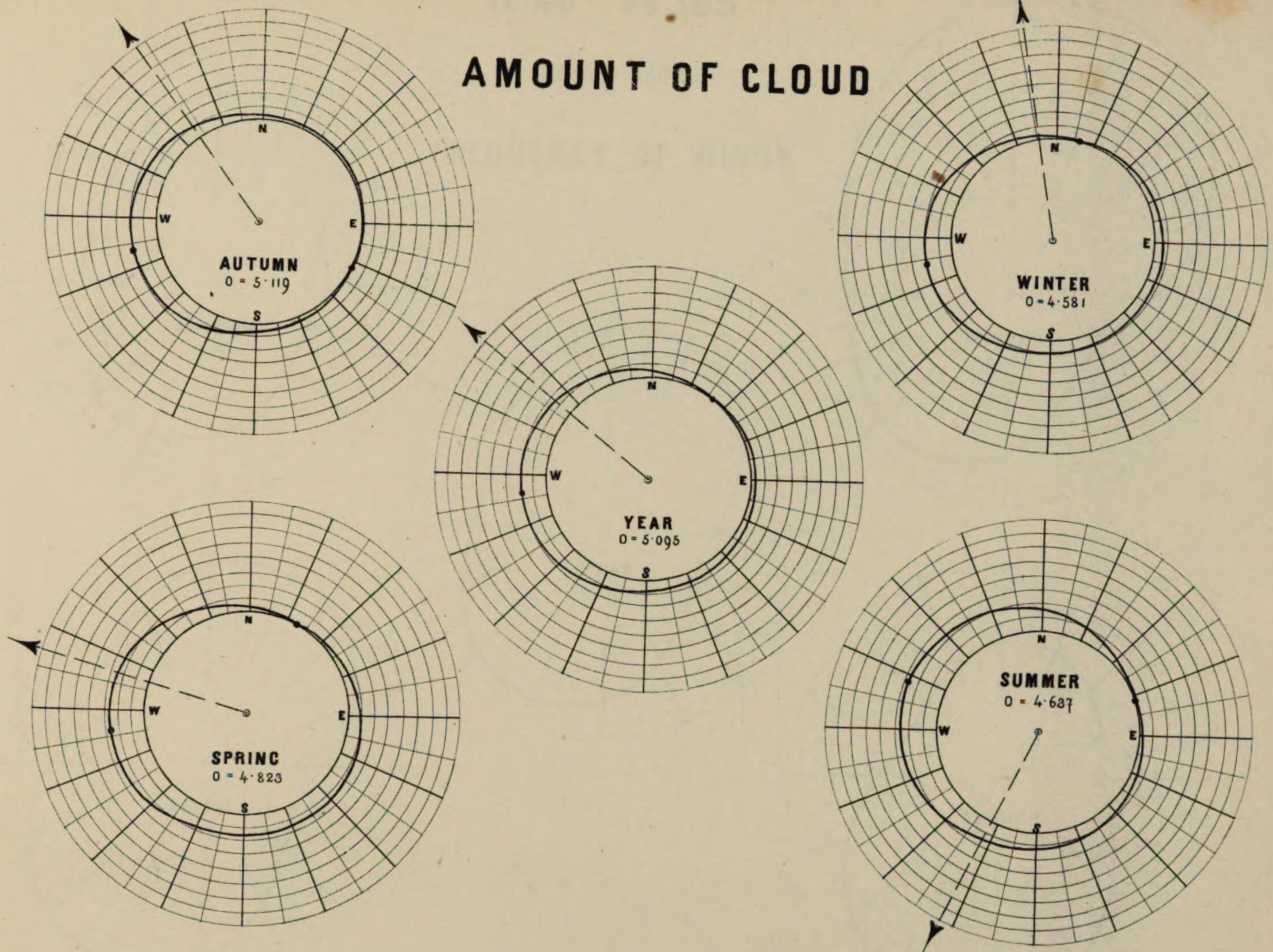


WIND-ROSES

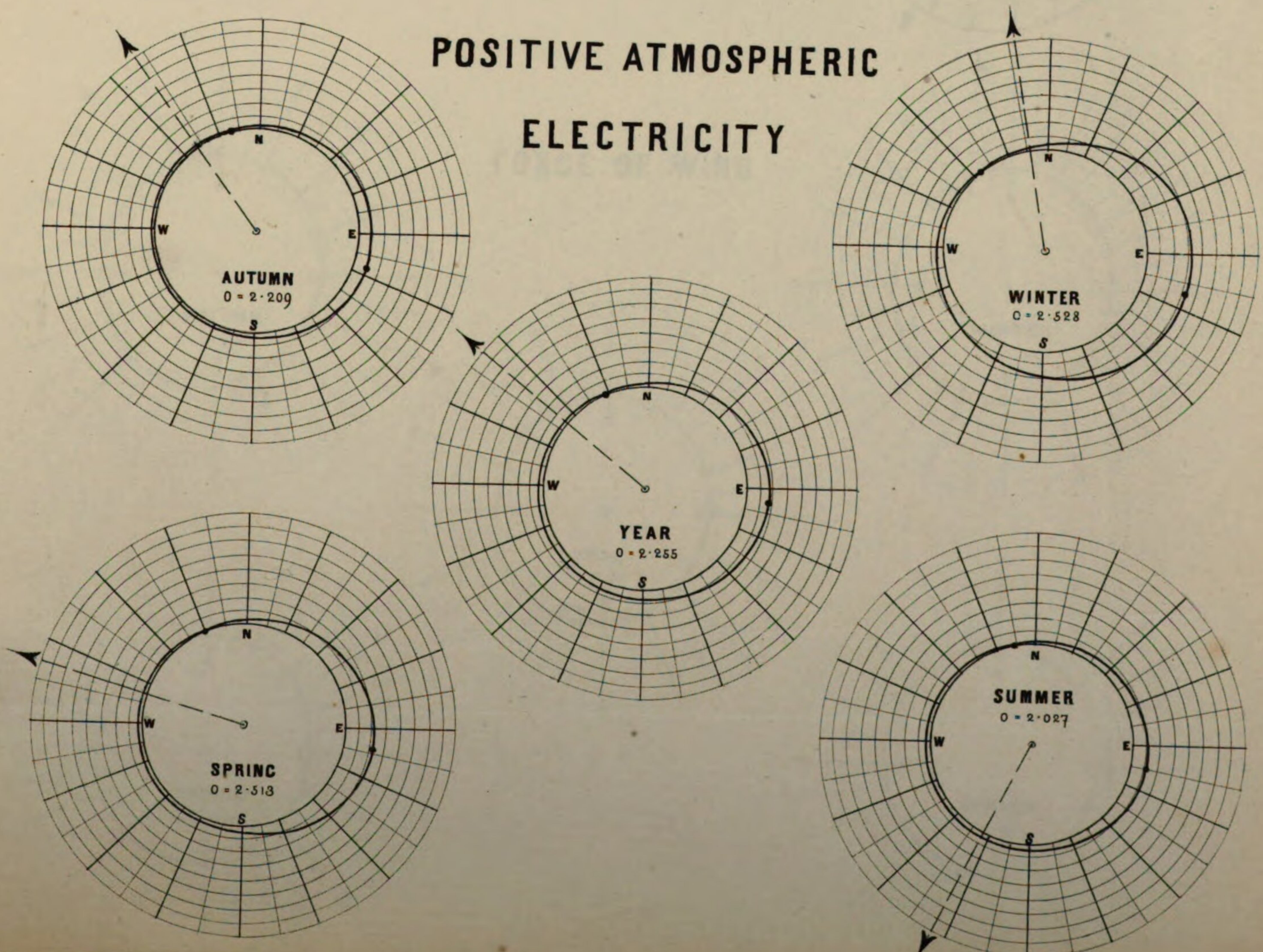
Table 14.

1858 - 1863

AMOUNT OF CLOUD



POSITIVE ATMOSPHERIC ELECTRICITY



23207-0119

AMOUNT OF CLOUD

200-0 10 300-0 200-0



POSITIVE ATMOSPHERIC

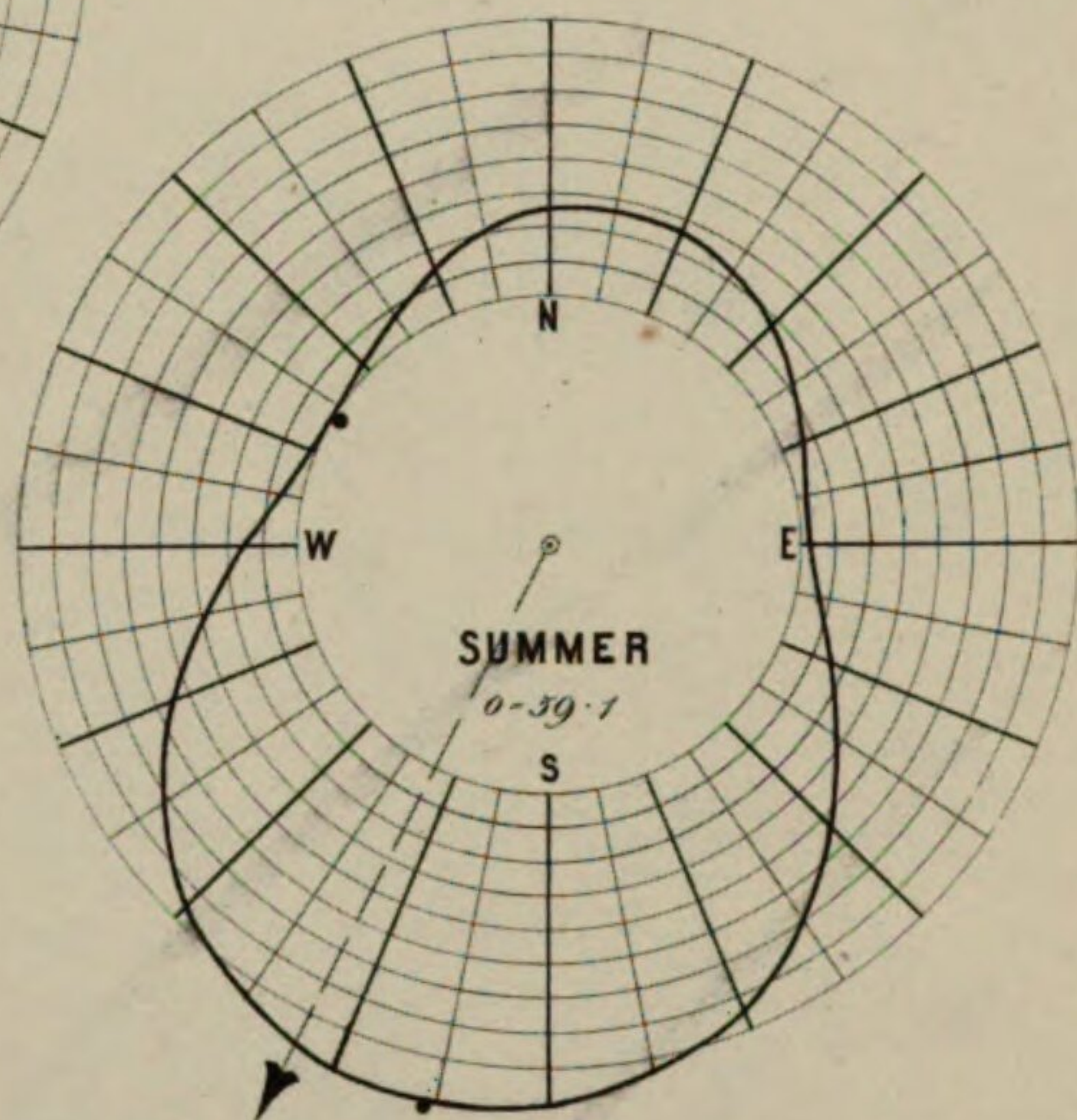
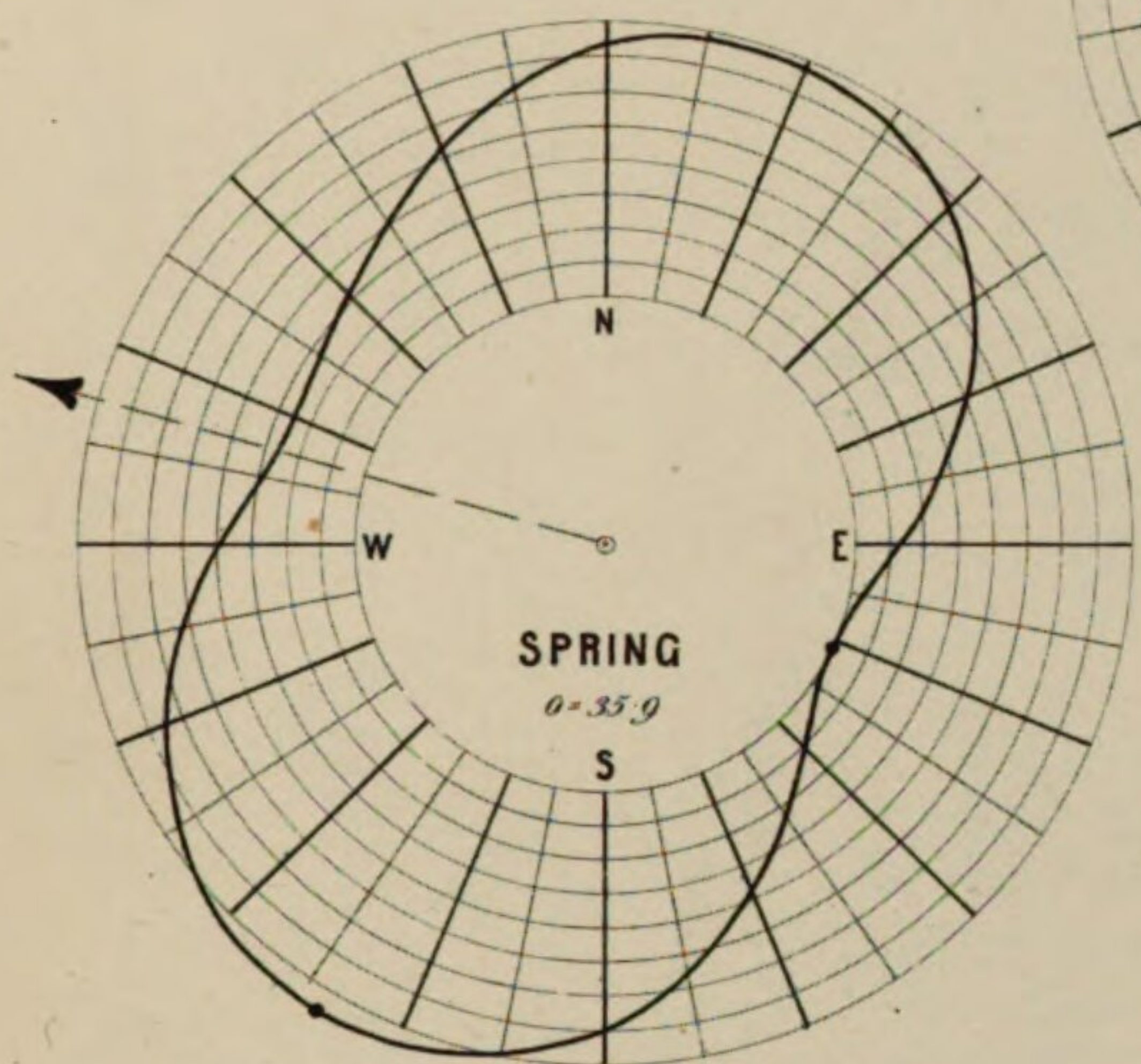
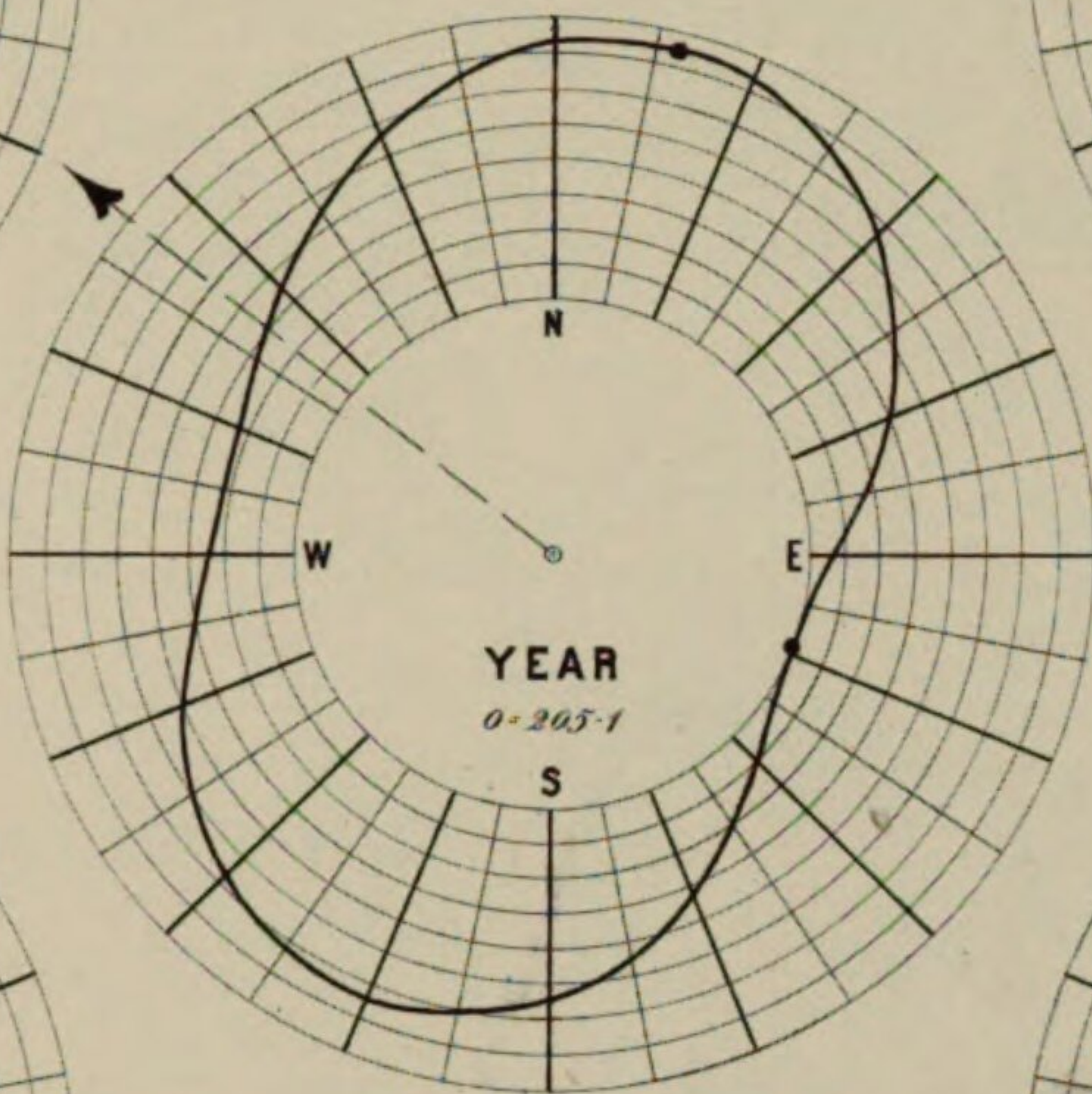
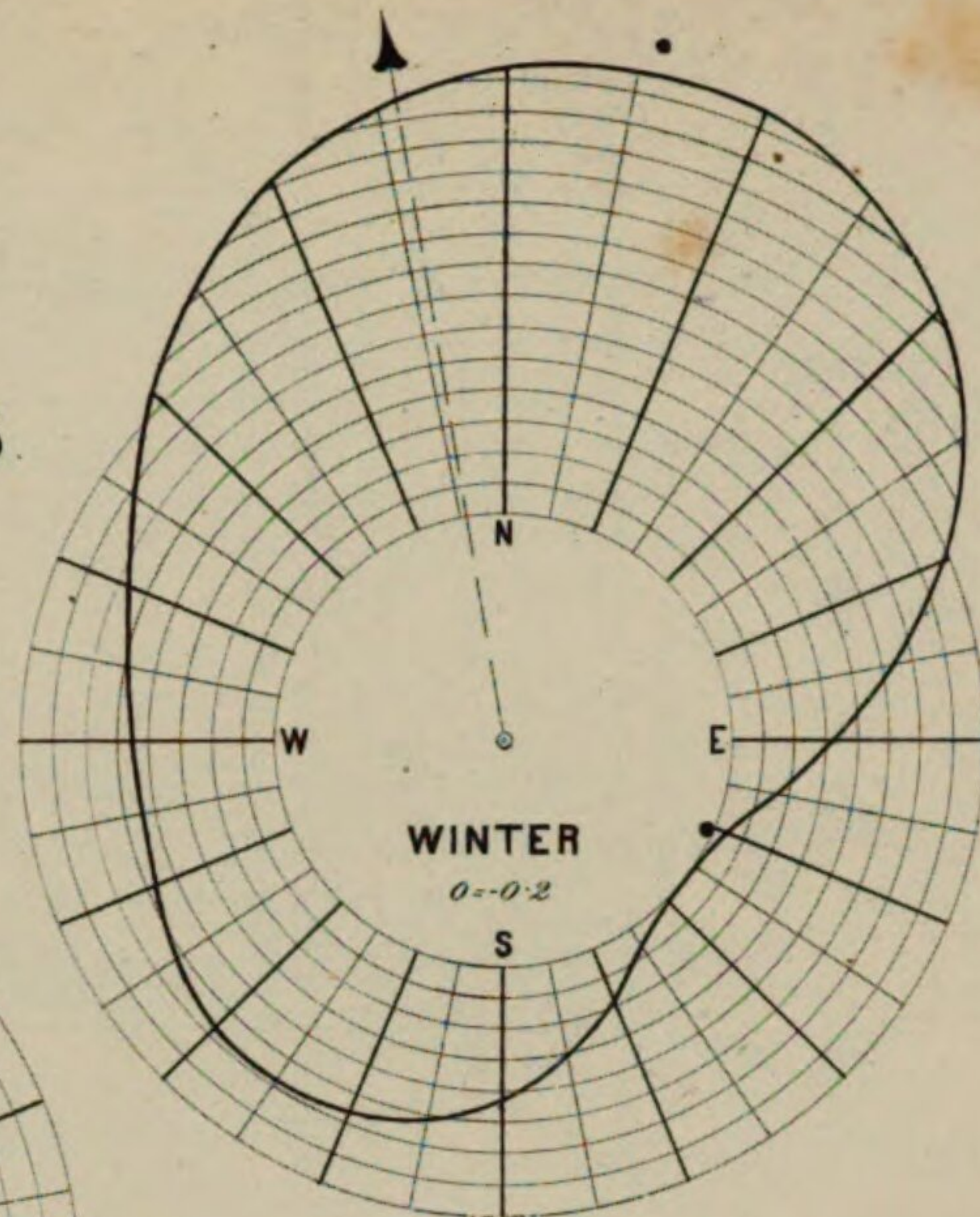
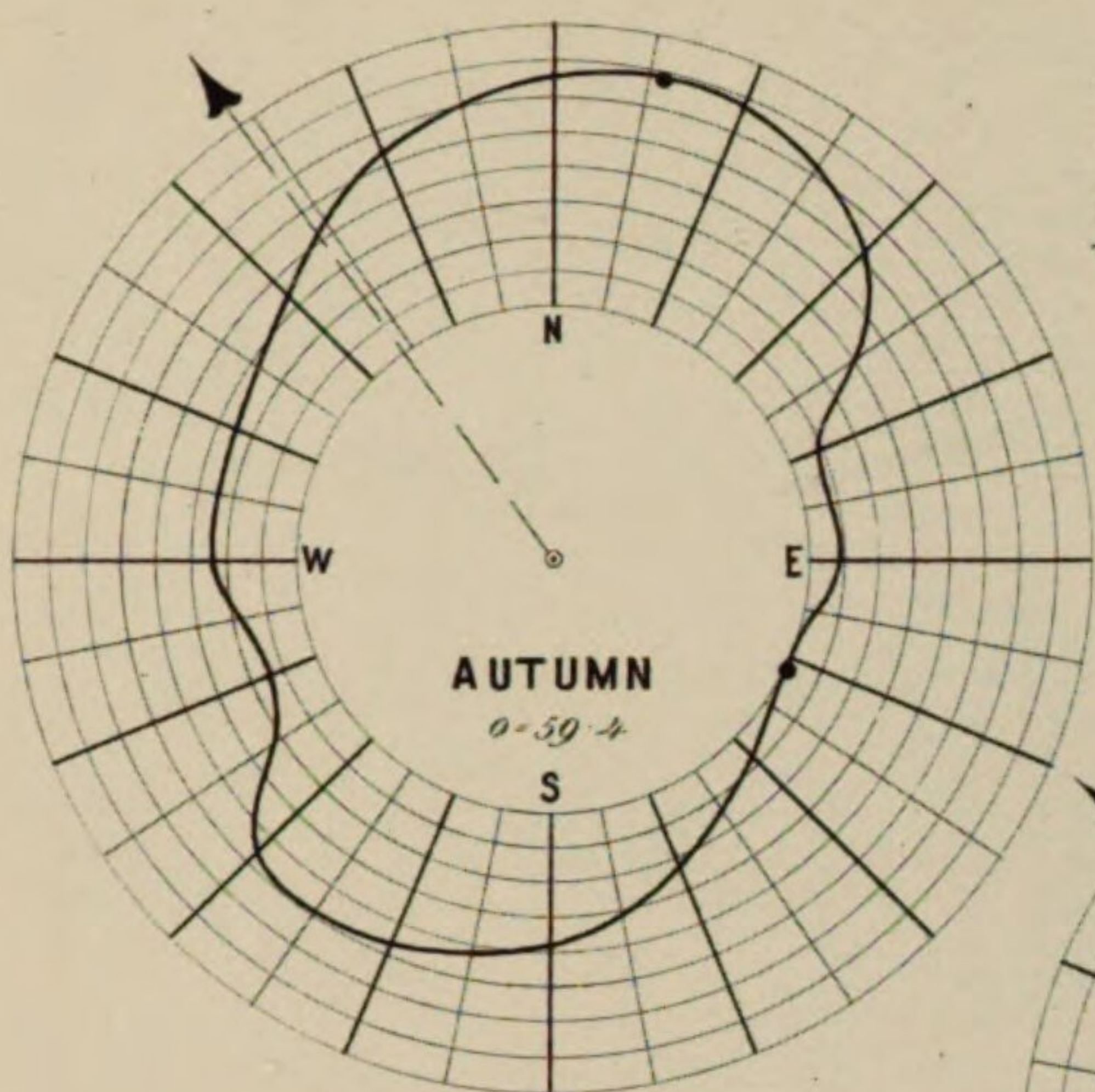
ELECTRICITY



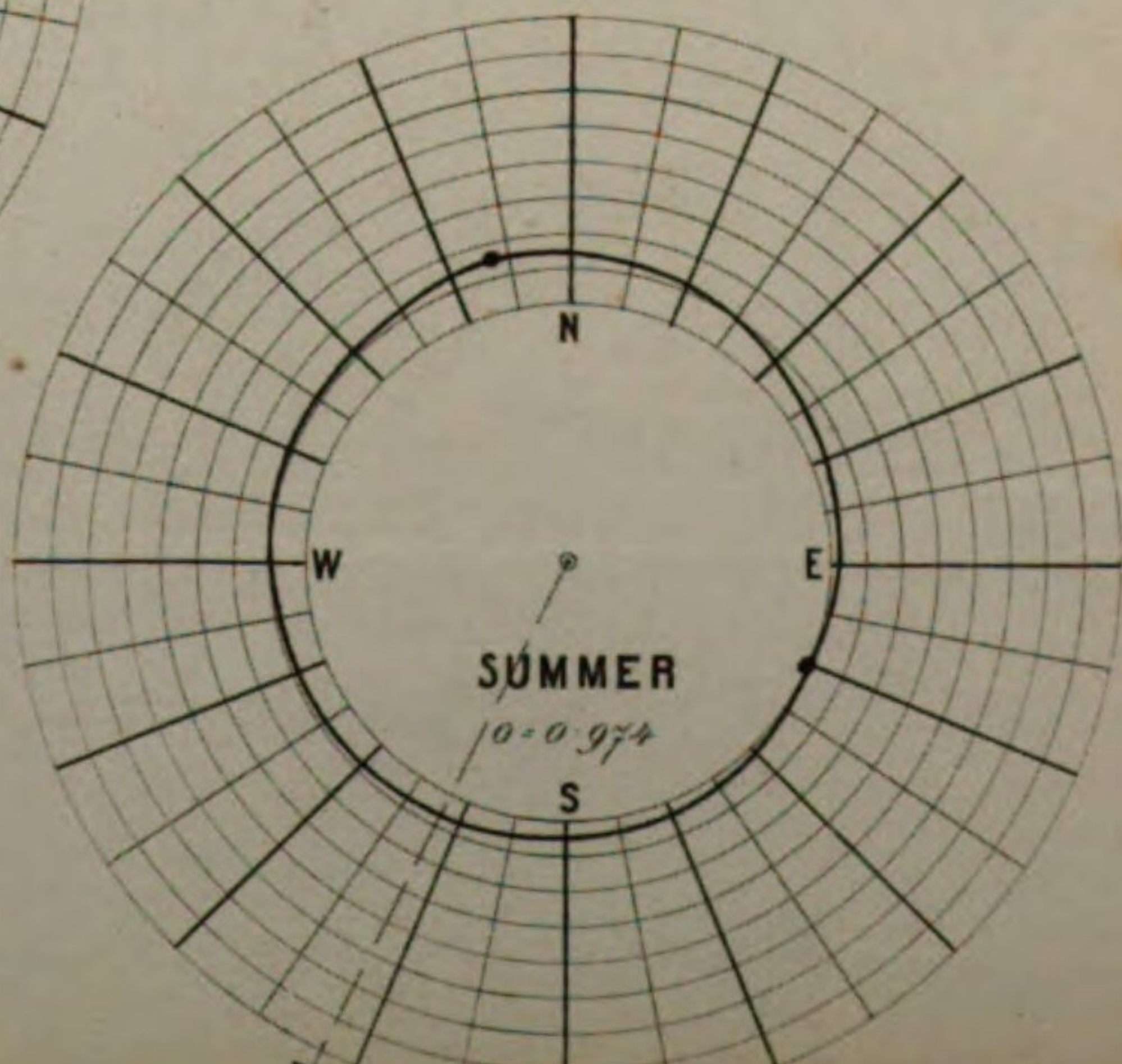
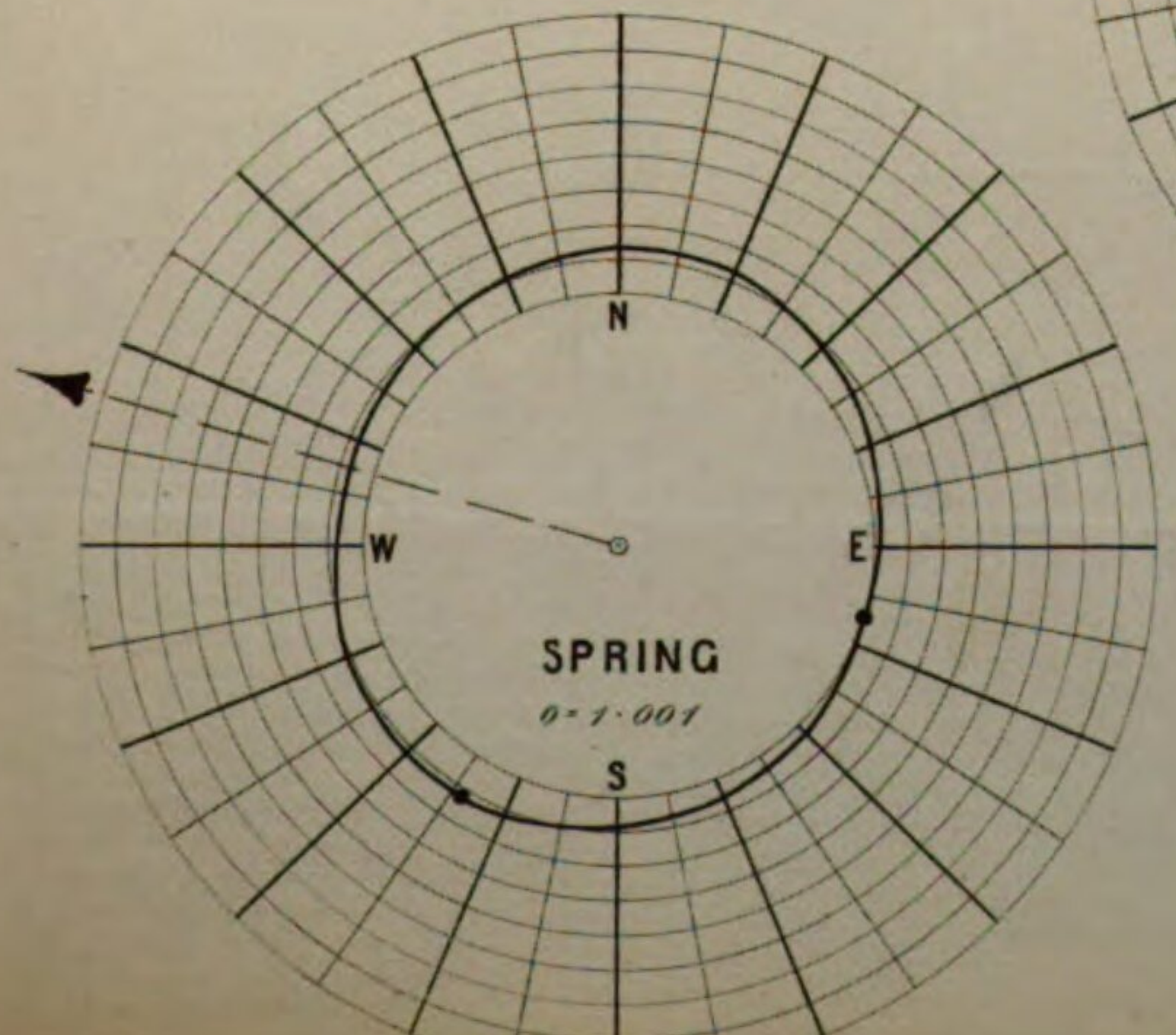
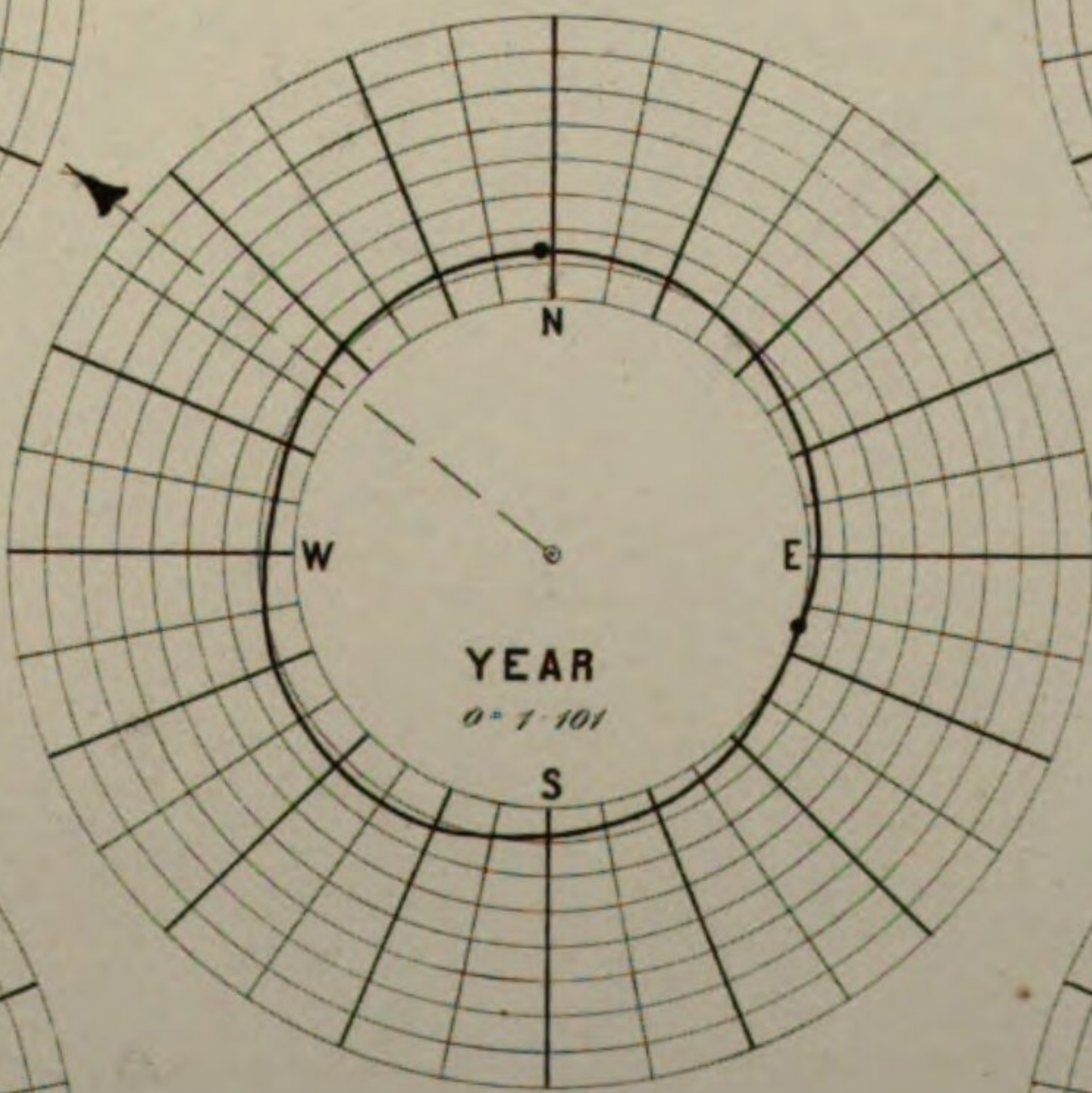
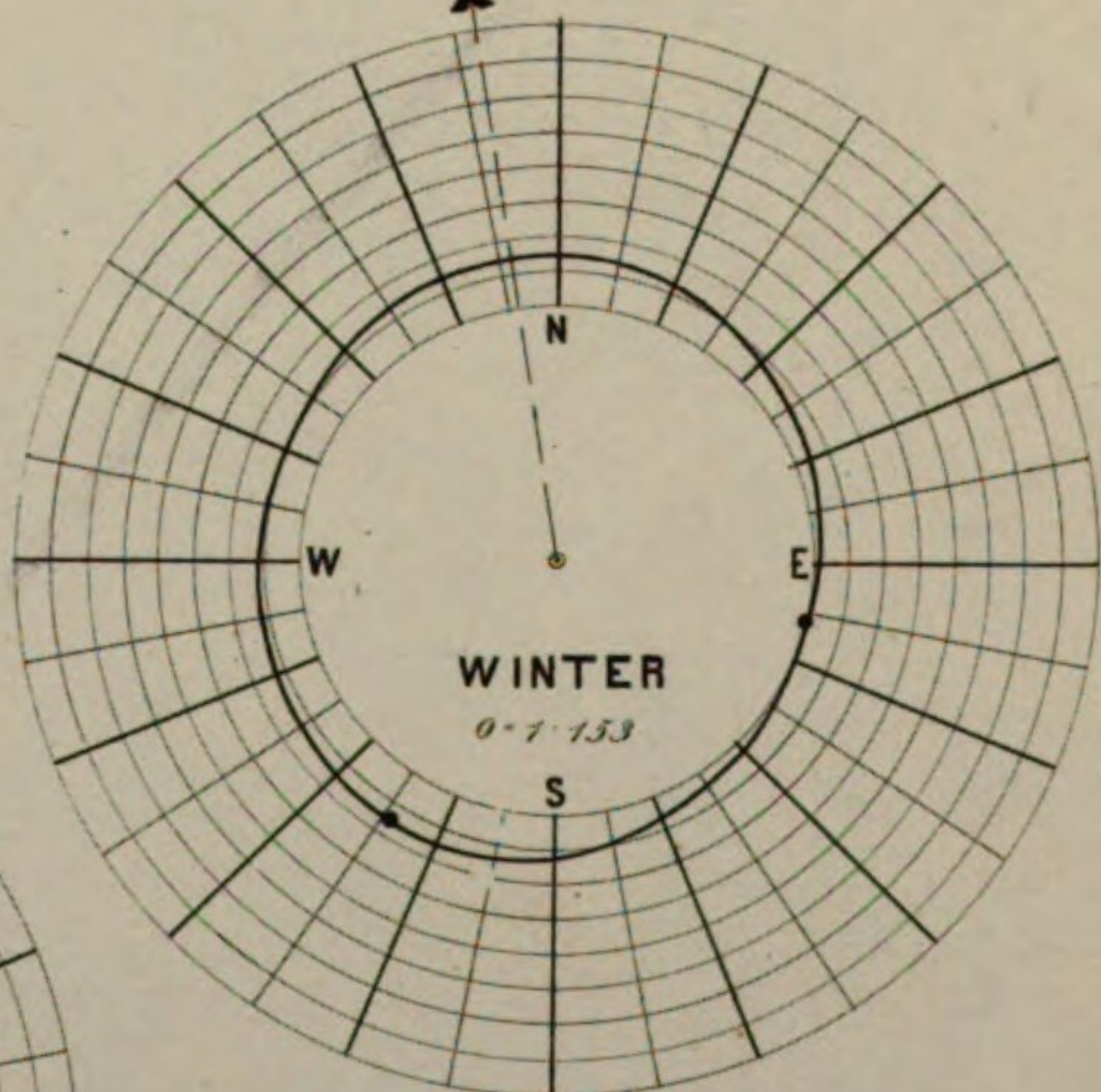
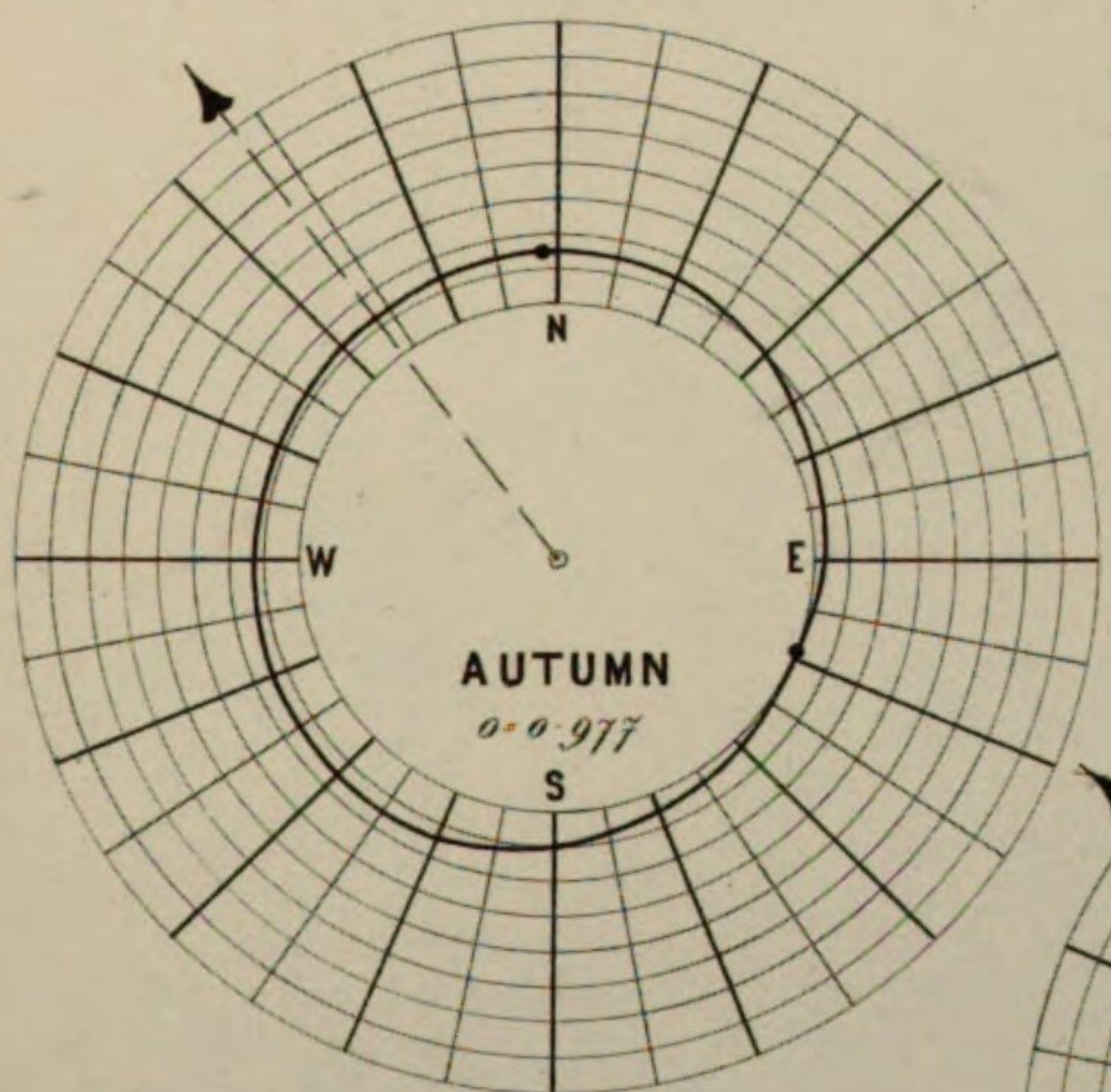
WIND - ROSES

1858 — 1863

FREQUENCY OF WINDS



FORCE OF WIND

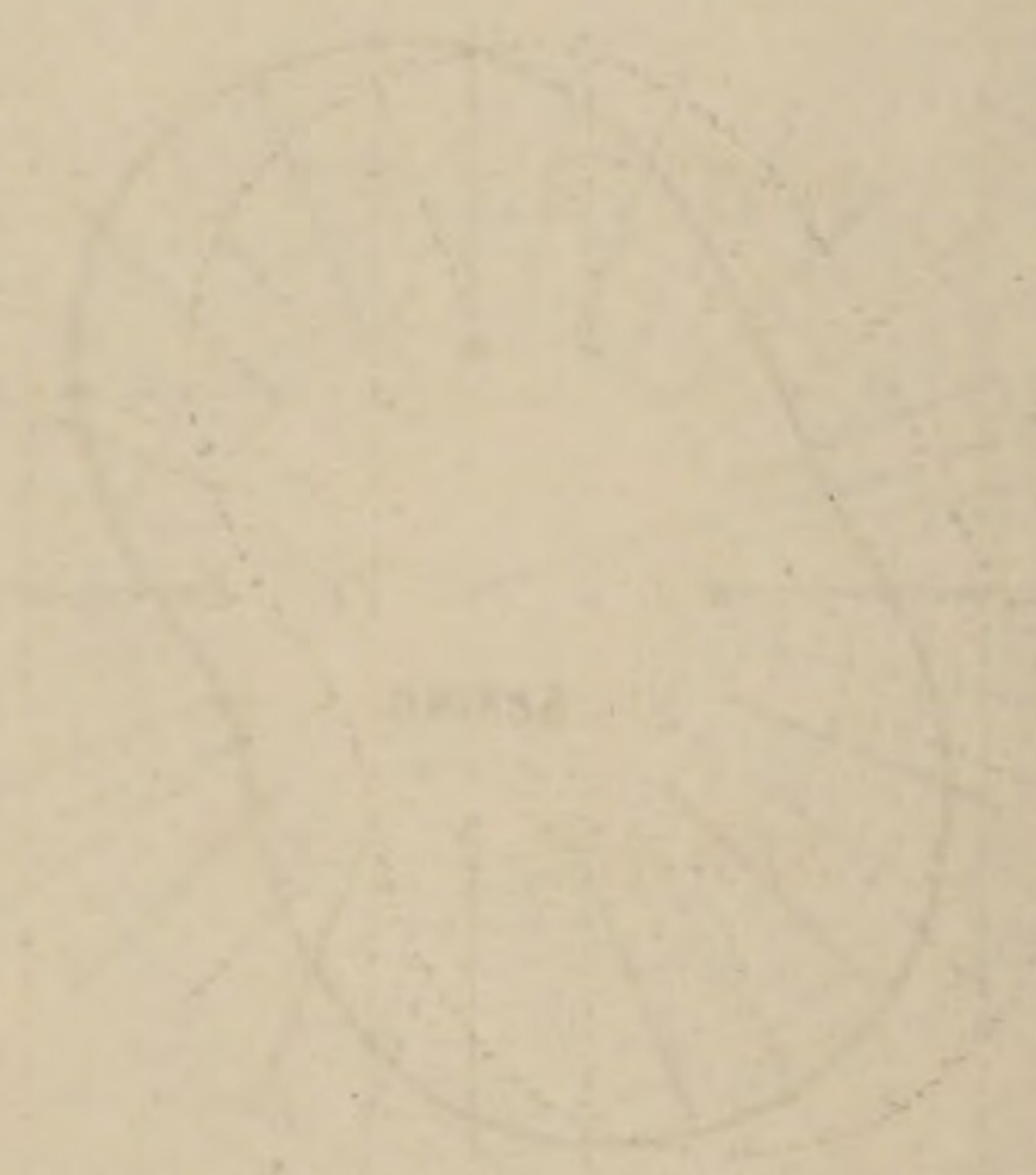
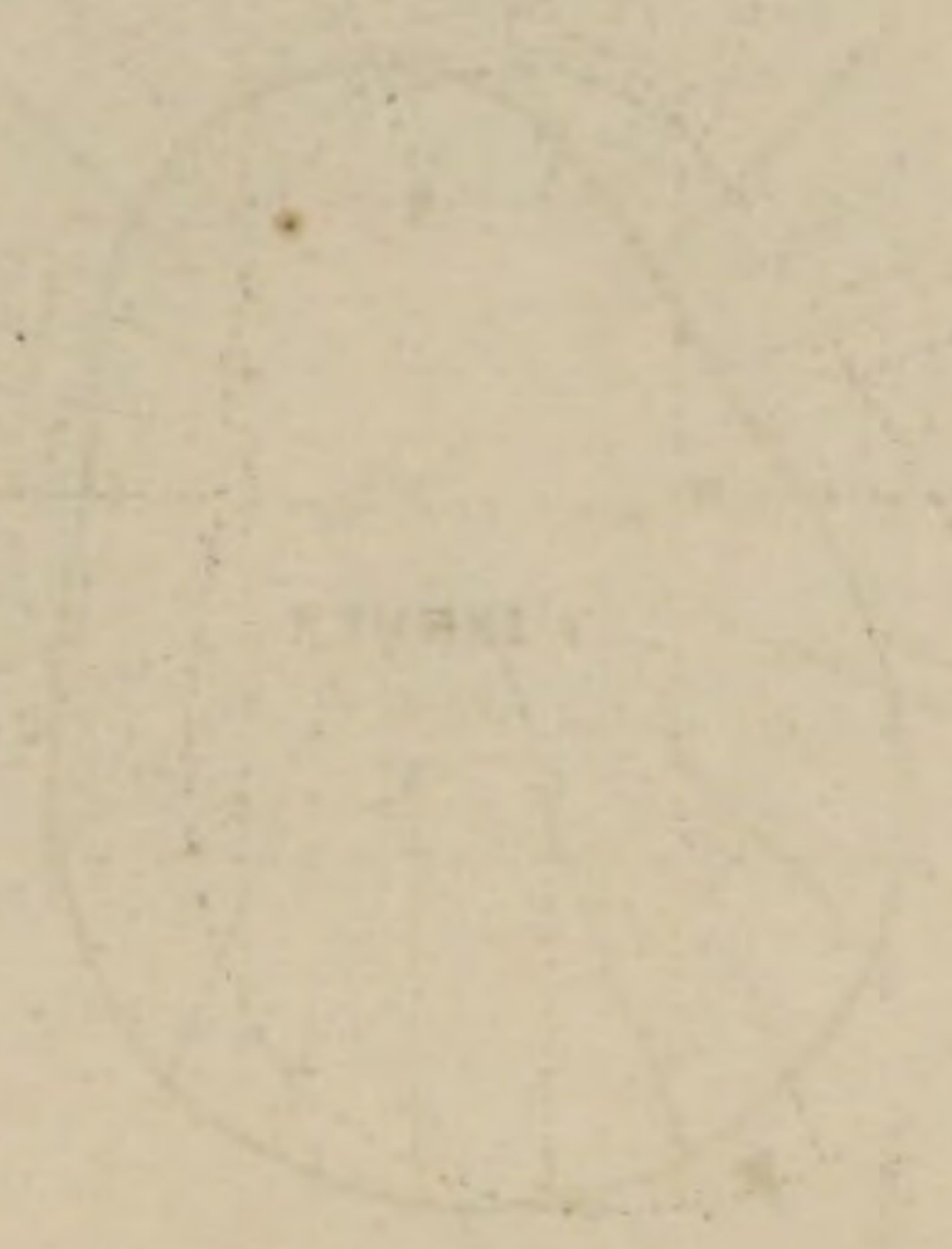
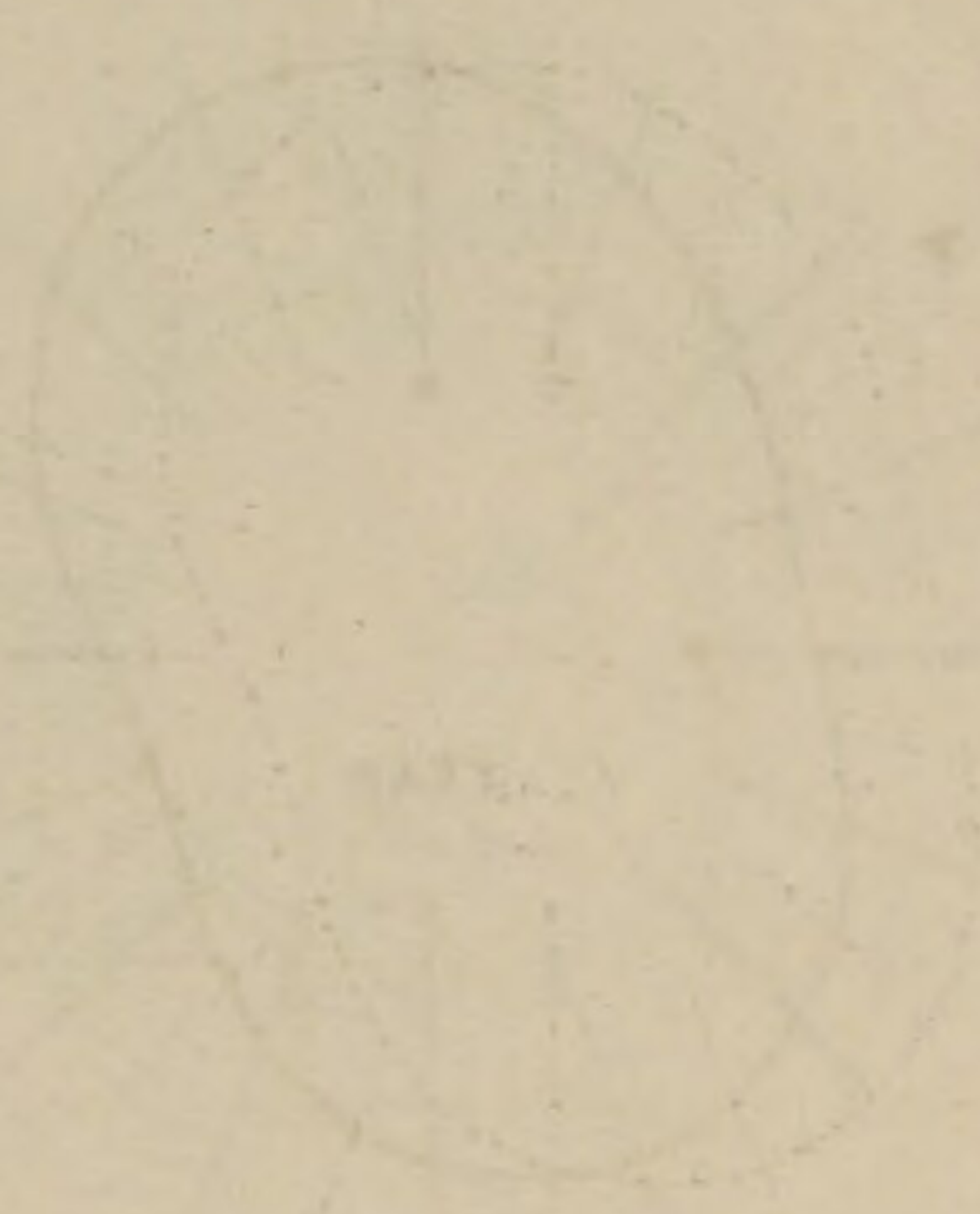
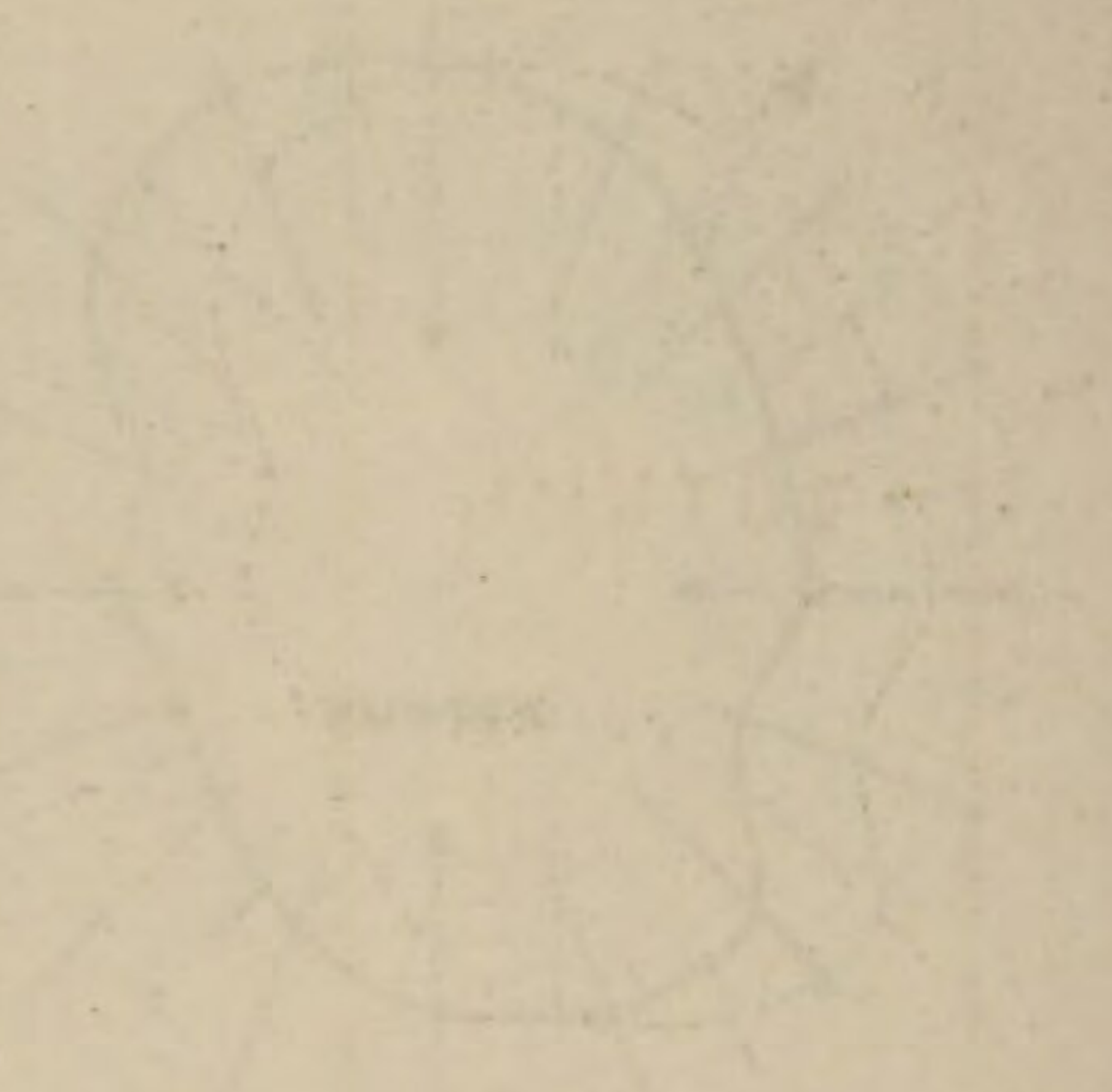
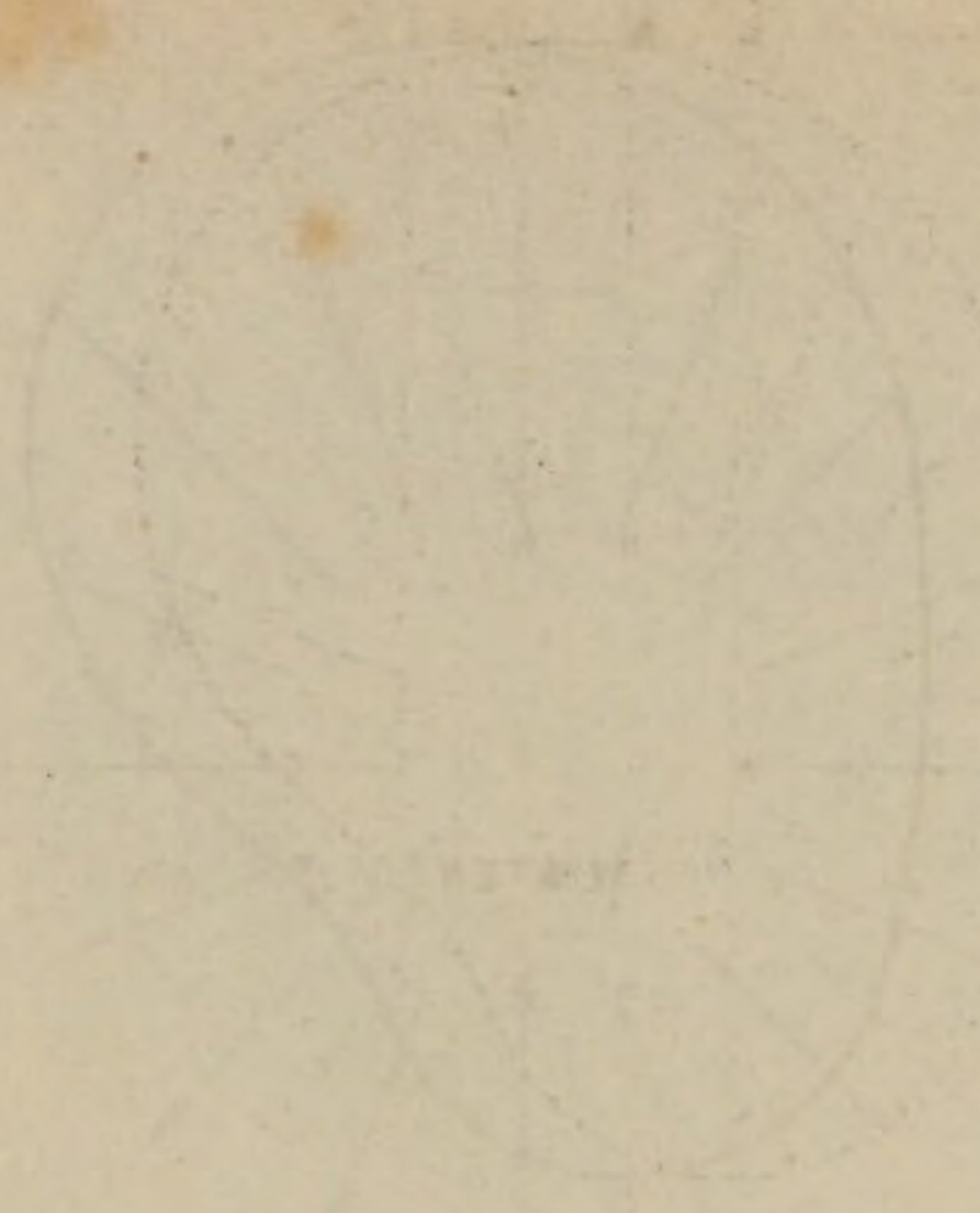


THE WIND AND THE WAVE

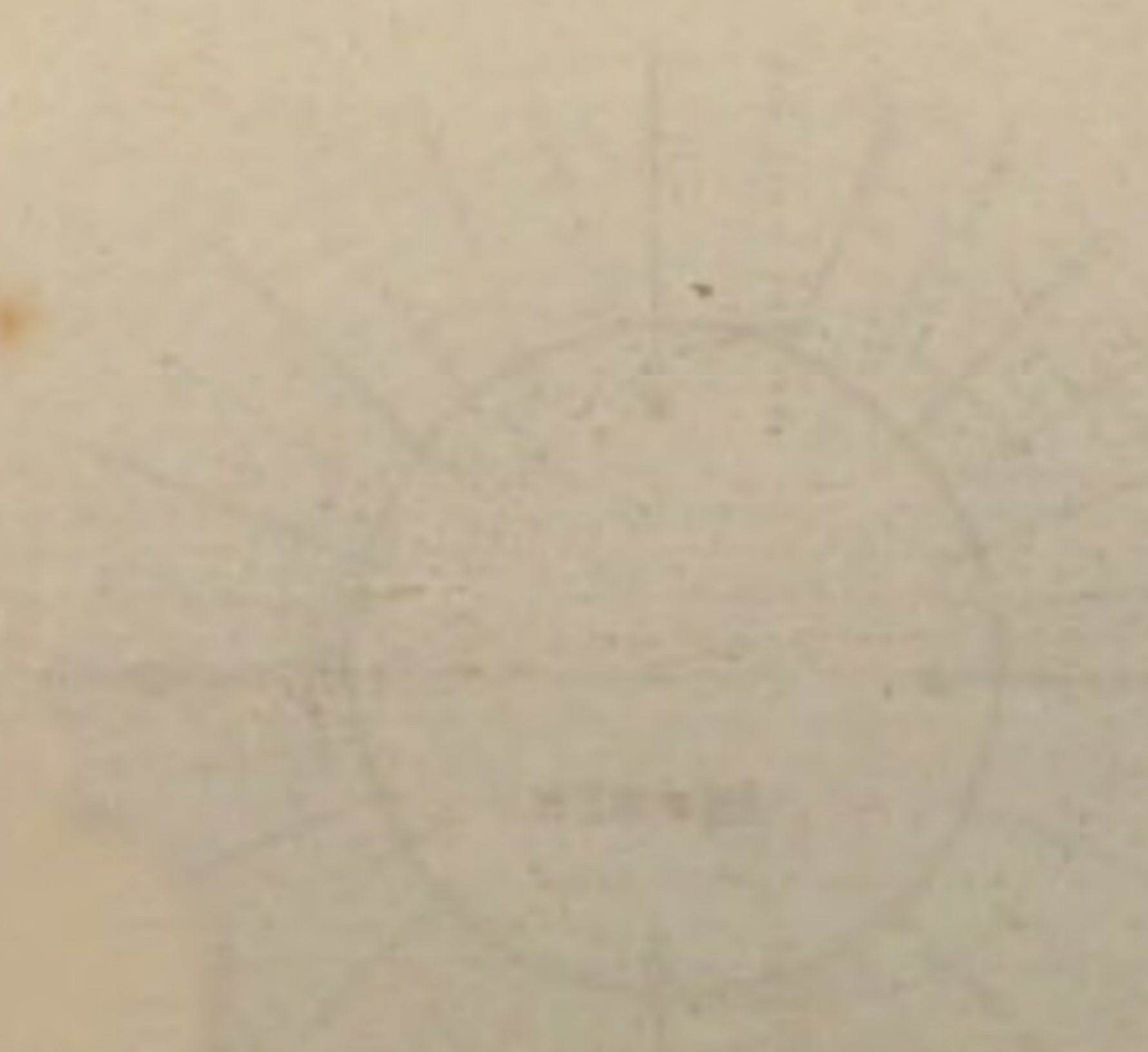
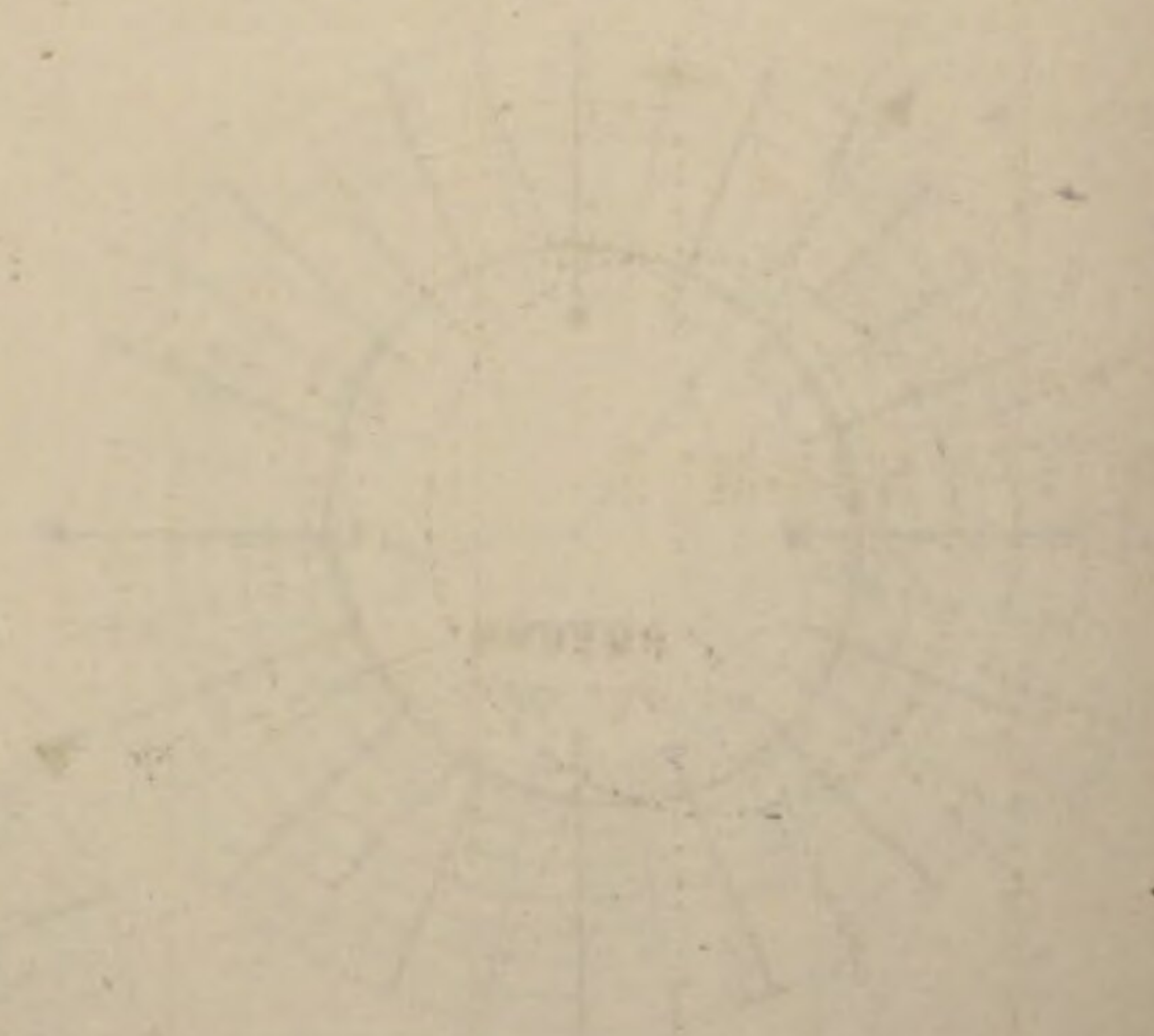
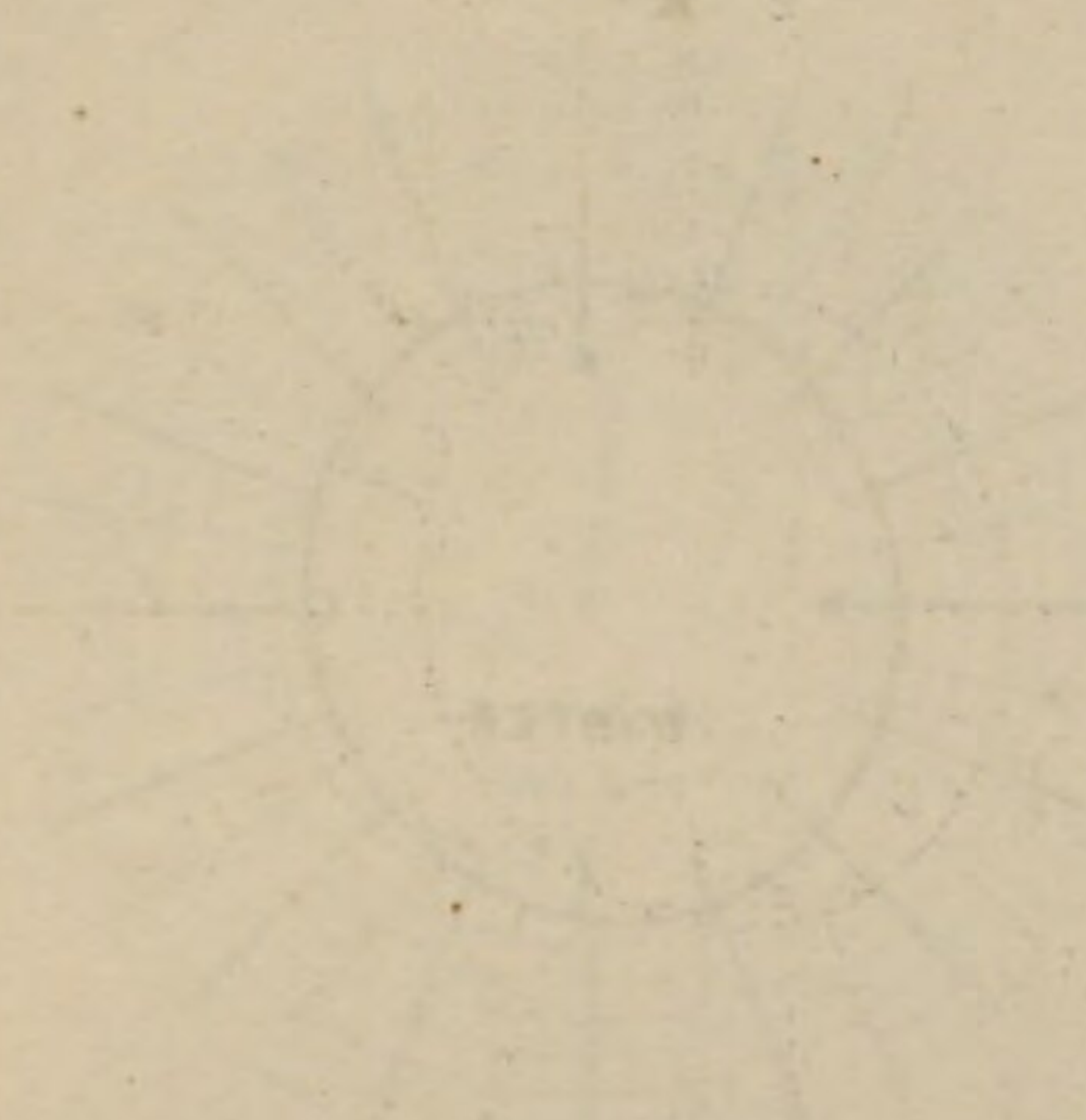
THE WIND AND THE WAVE

THE WIND AND THE WAVE

THE WIND AND THE WAVE

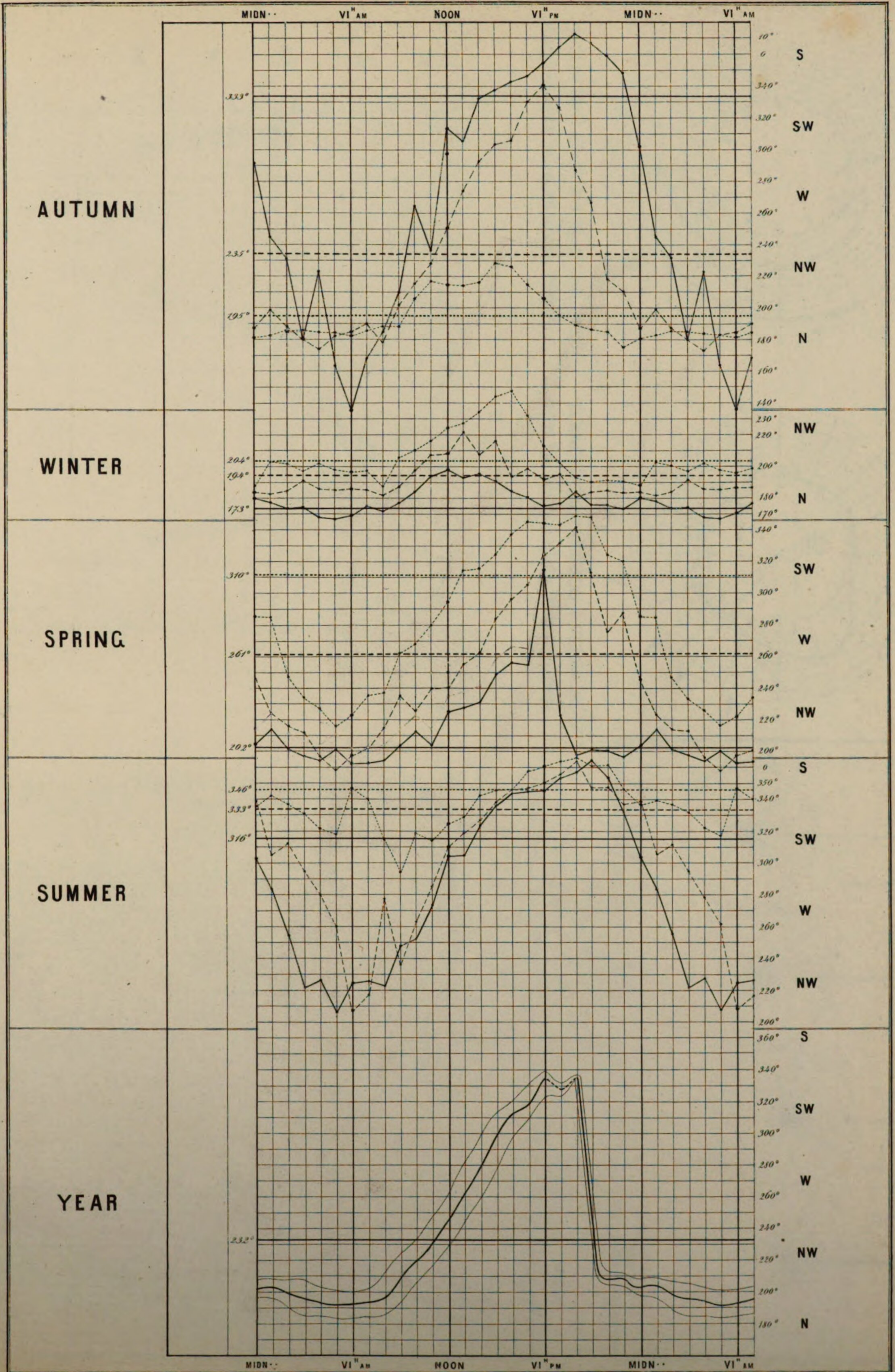


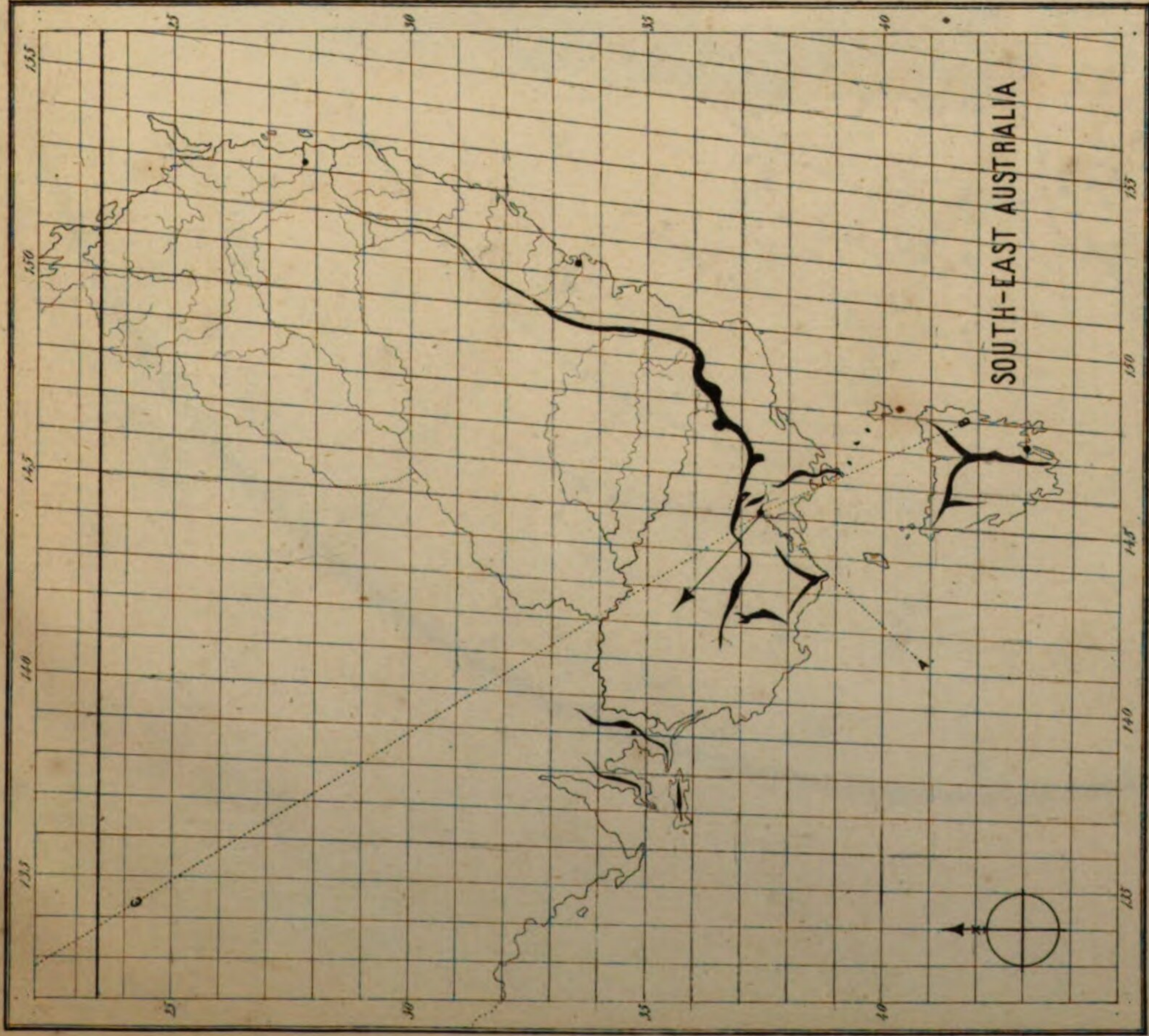
THE WIND AND THE WAVE



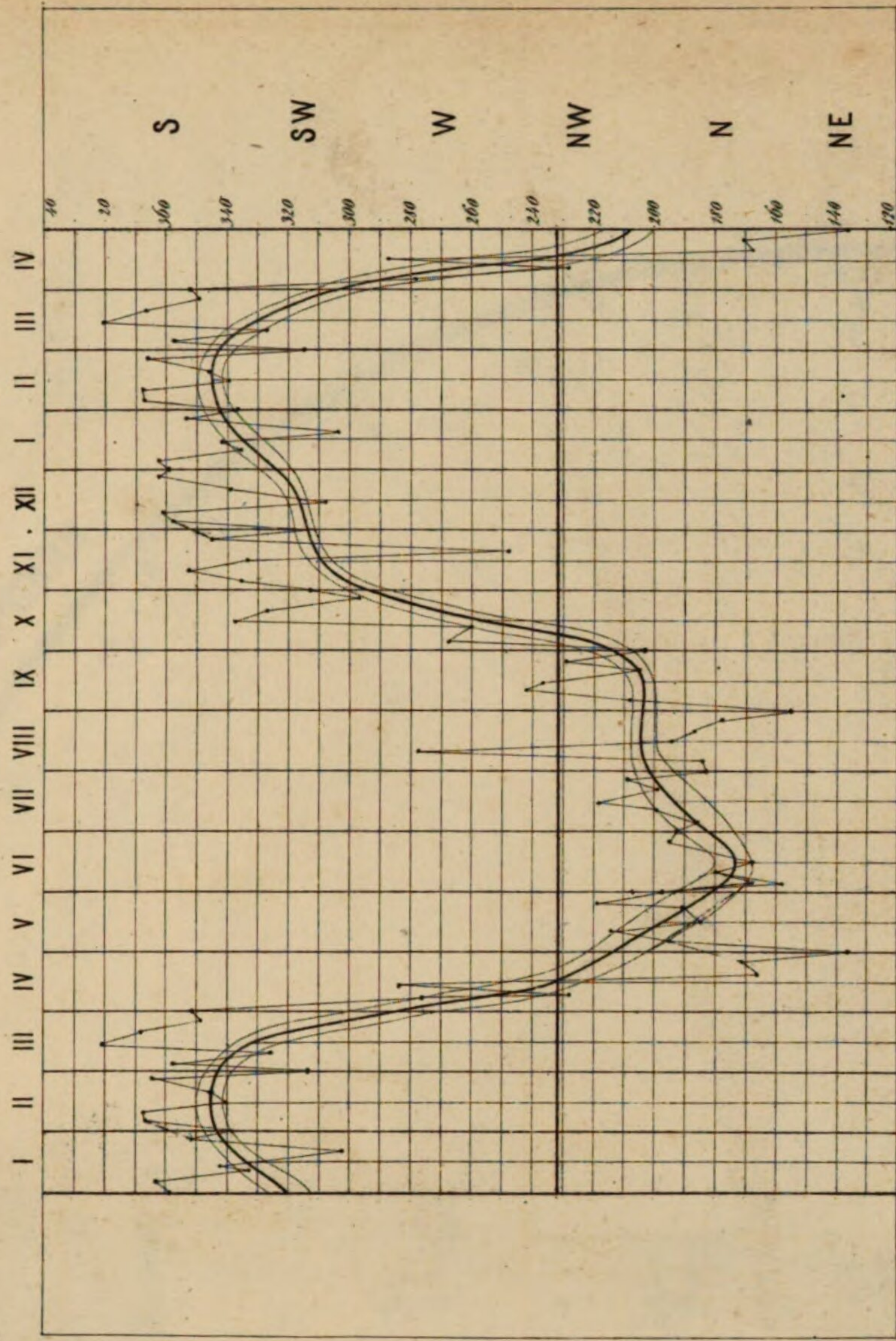
CURVES SHEWING THE HOURLY VARIATION IN MEAN DIRECTION OF WIND

Table 16.

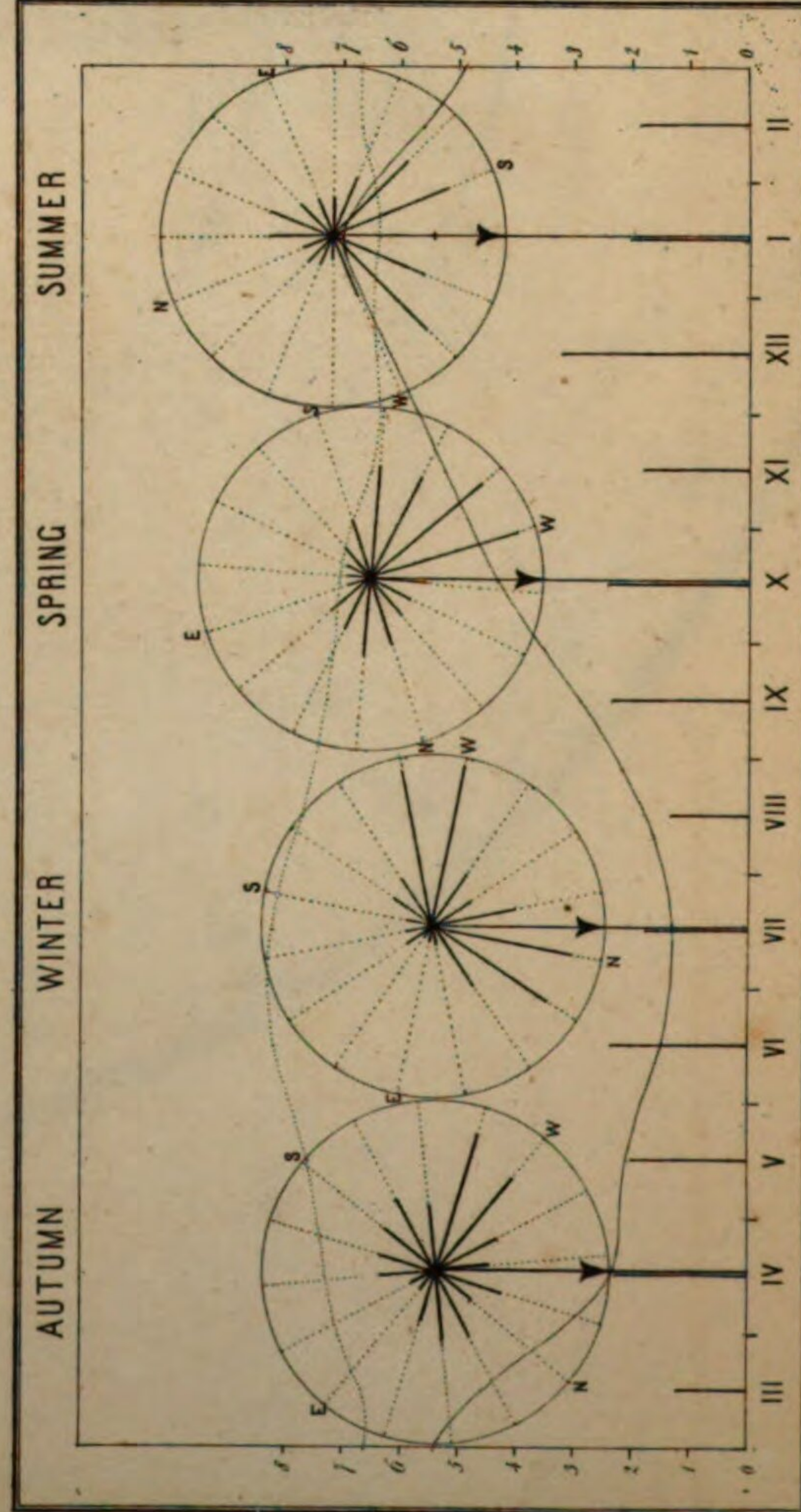




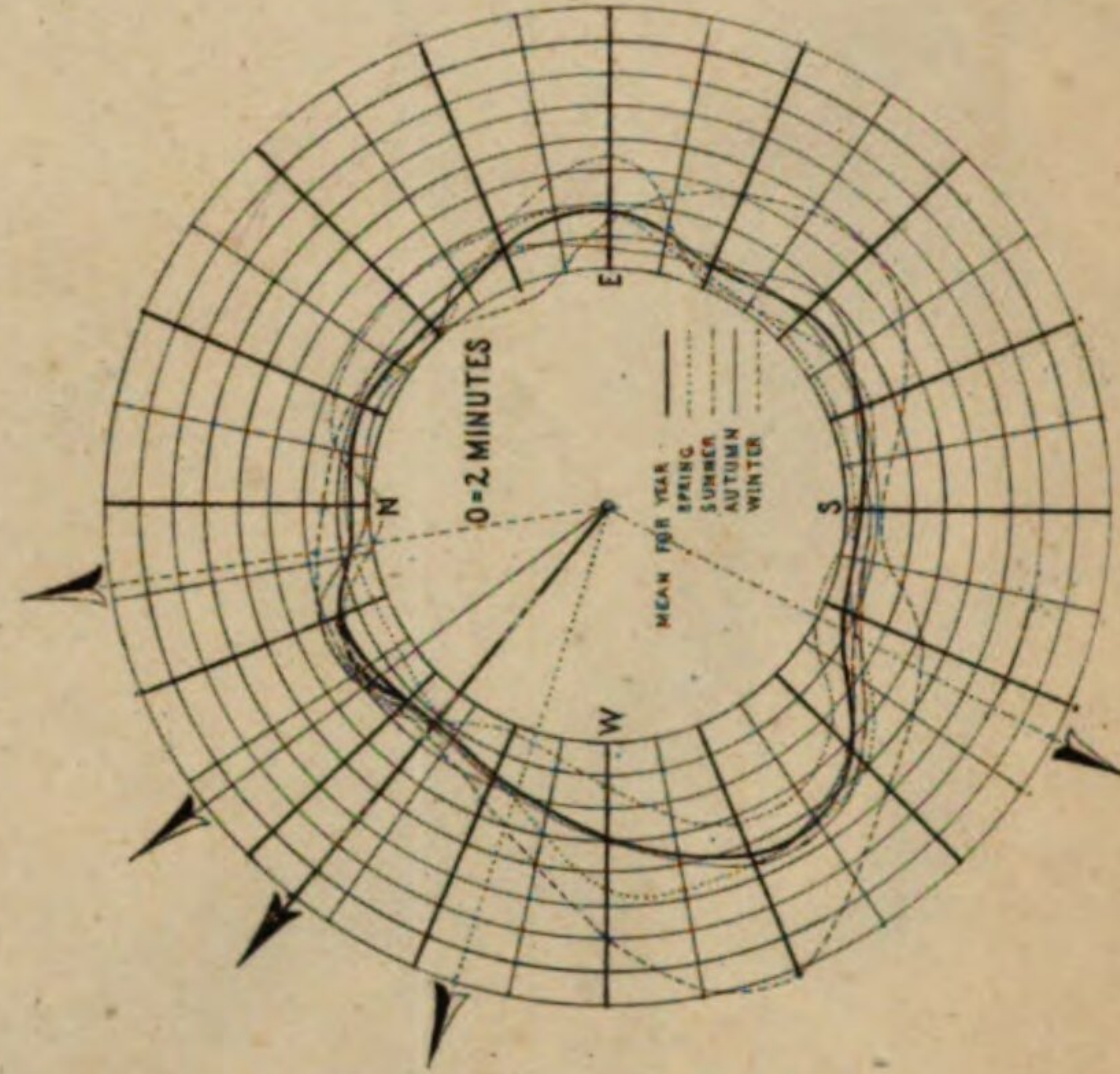
ANNUAL VARIATION OF THE MEAN DIRECTION OF THE WIND



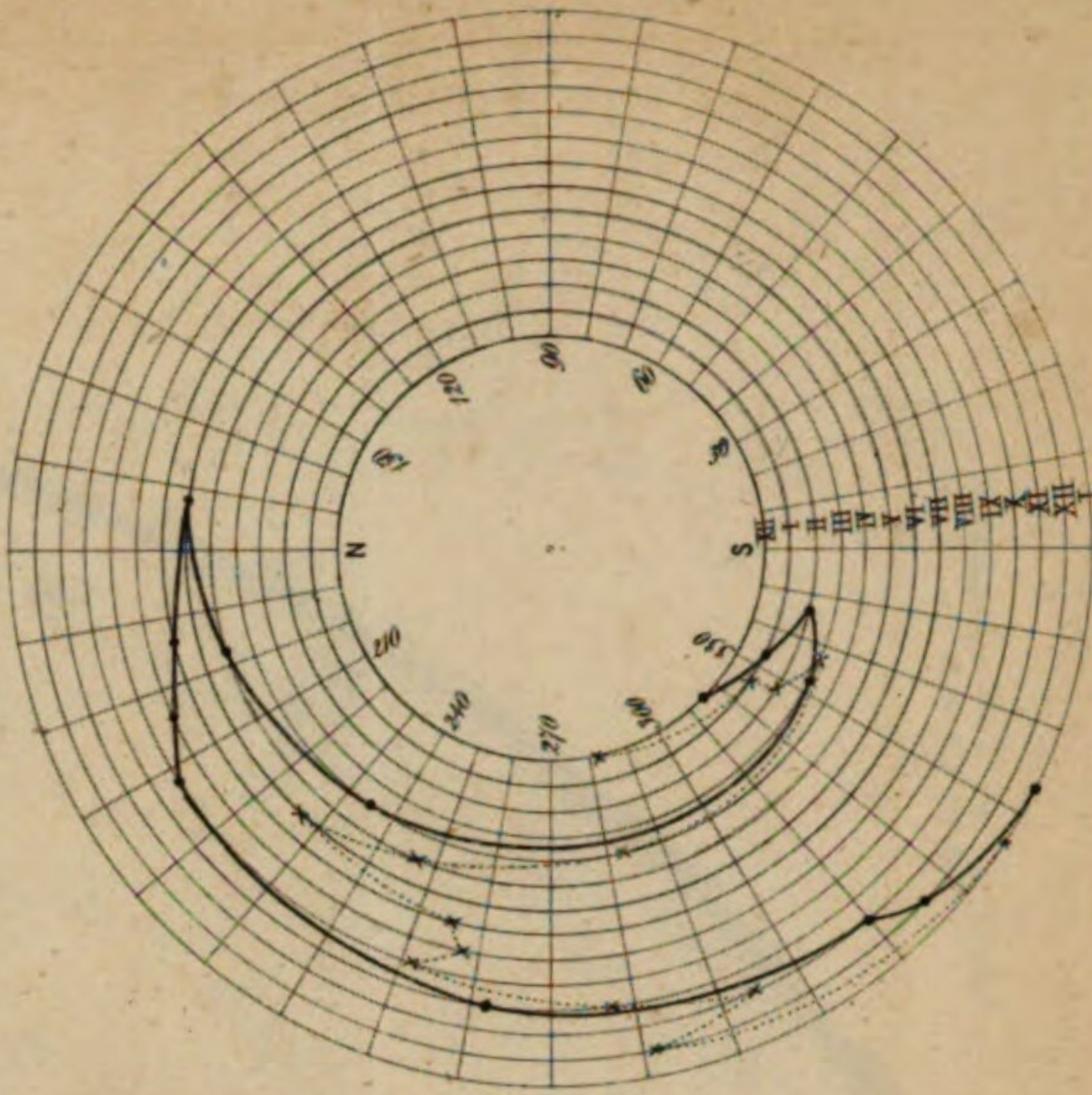
ANNUAL VARIATION OF AMOUNT OF RAIN EVAPORATION AND RELATIVE HUMIDITY, AND WINDROSES FOR AMOUNT OF RAIN



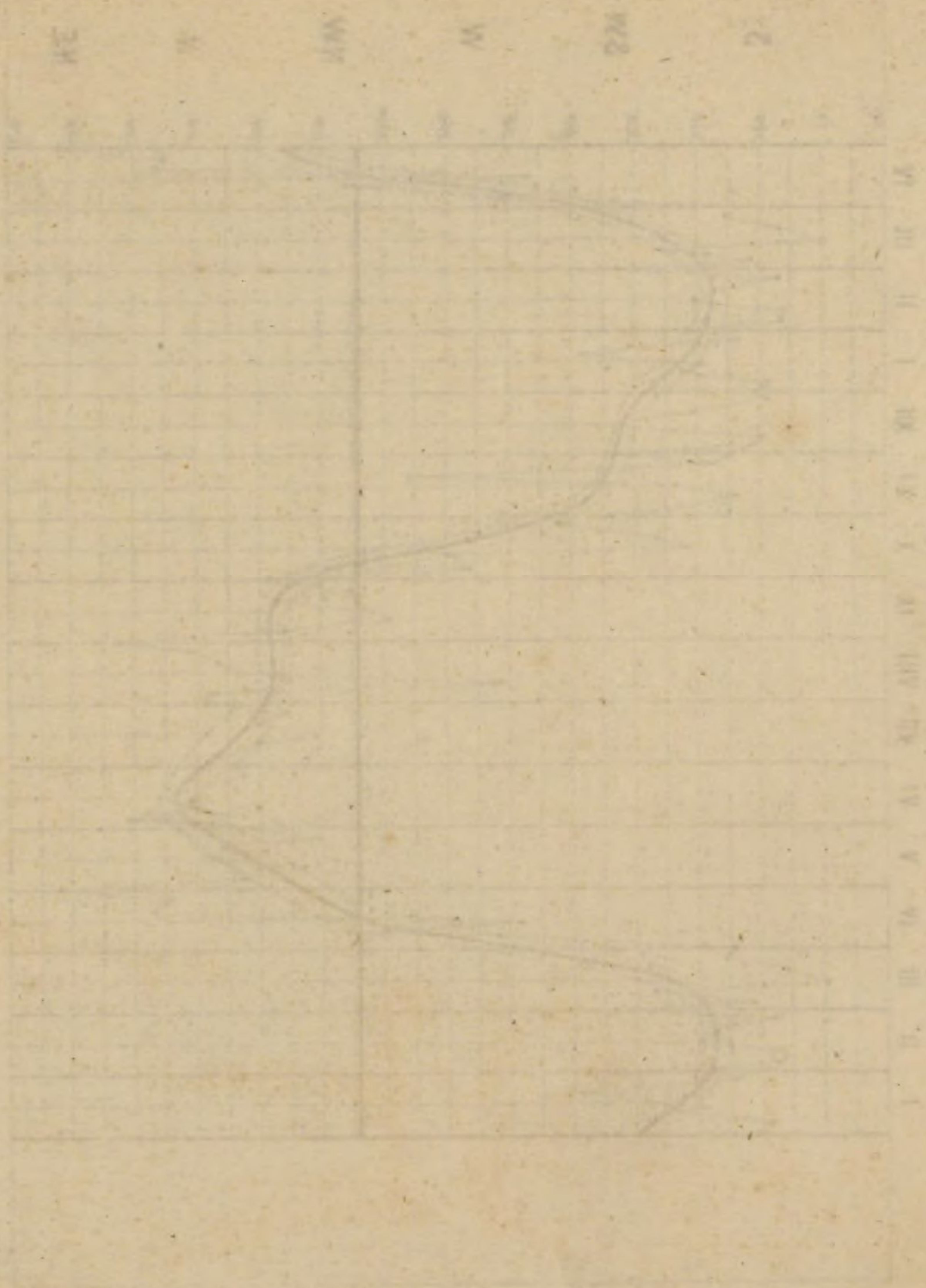
NUMBER OF MINUTES OF RAIN FOR ONE HOUR THE WIND BLEW FROM EACH OF SIXTEEN POINTS.



ANNUAL VARIATION IN THE MEAN DIRECTION OF THE UPPER AND LOWER CURRENT OF AIR



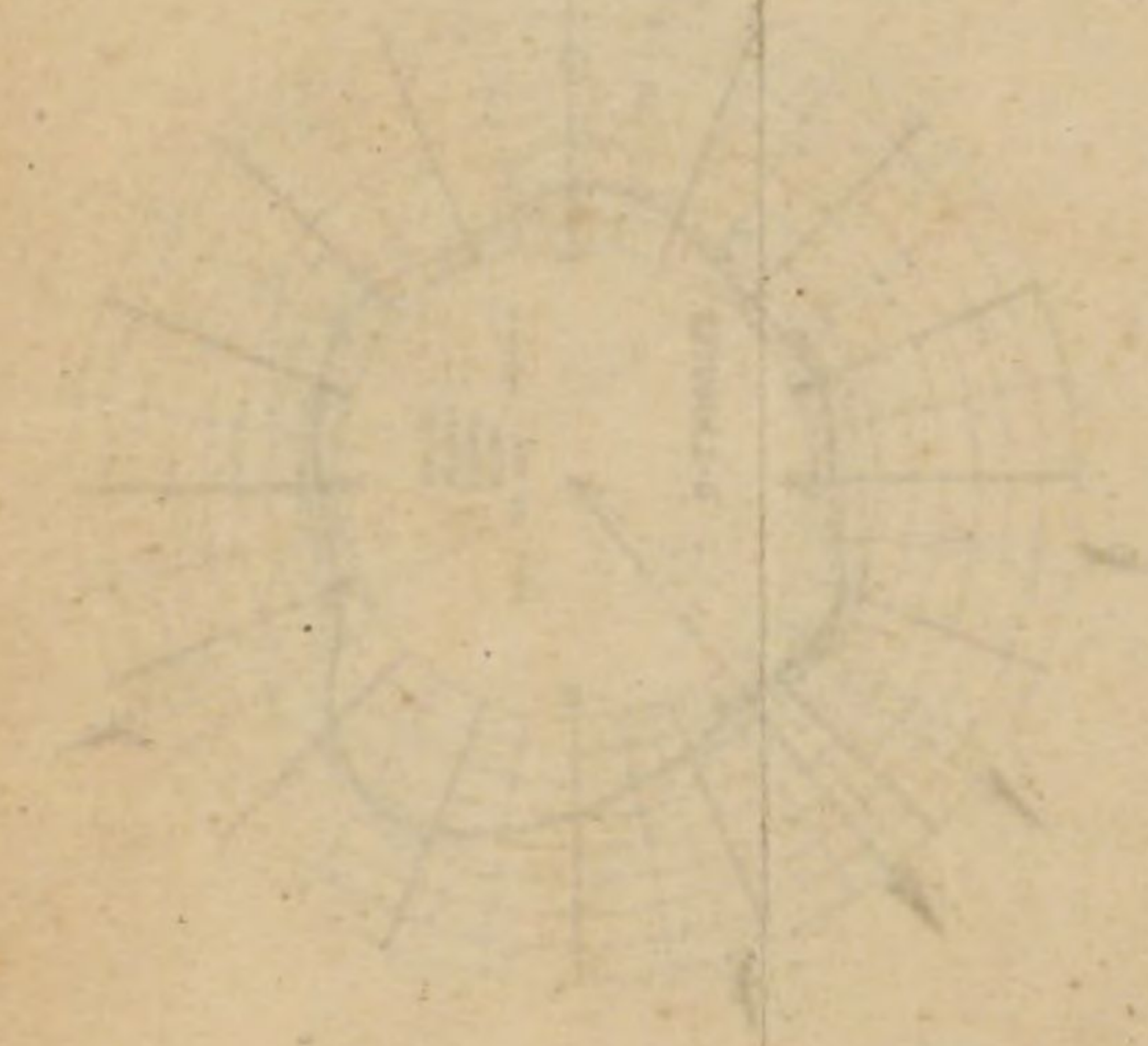
WINDS AT 1000 FT. IN THE WIND DIRECTION OF THE WIND



WINDS AT 1000 FT. IN THE WIND DIRECTION OF THE WIND



WINDS AT 1000 FT. IN THE WIND DIRECTION OF THE WIND



WINDS AT 1000 FT. IN THE WIND DIRECTION OF THE WIND

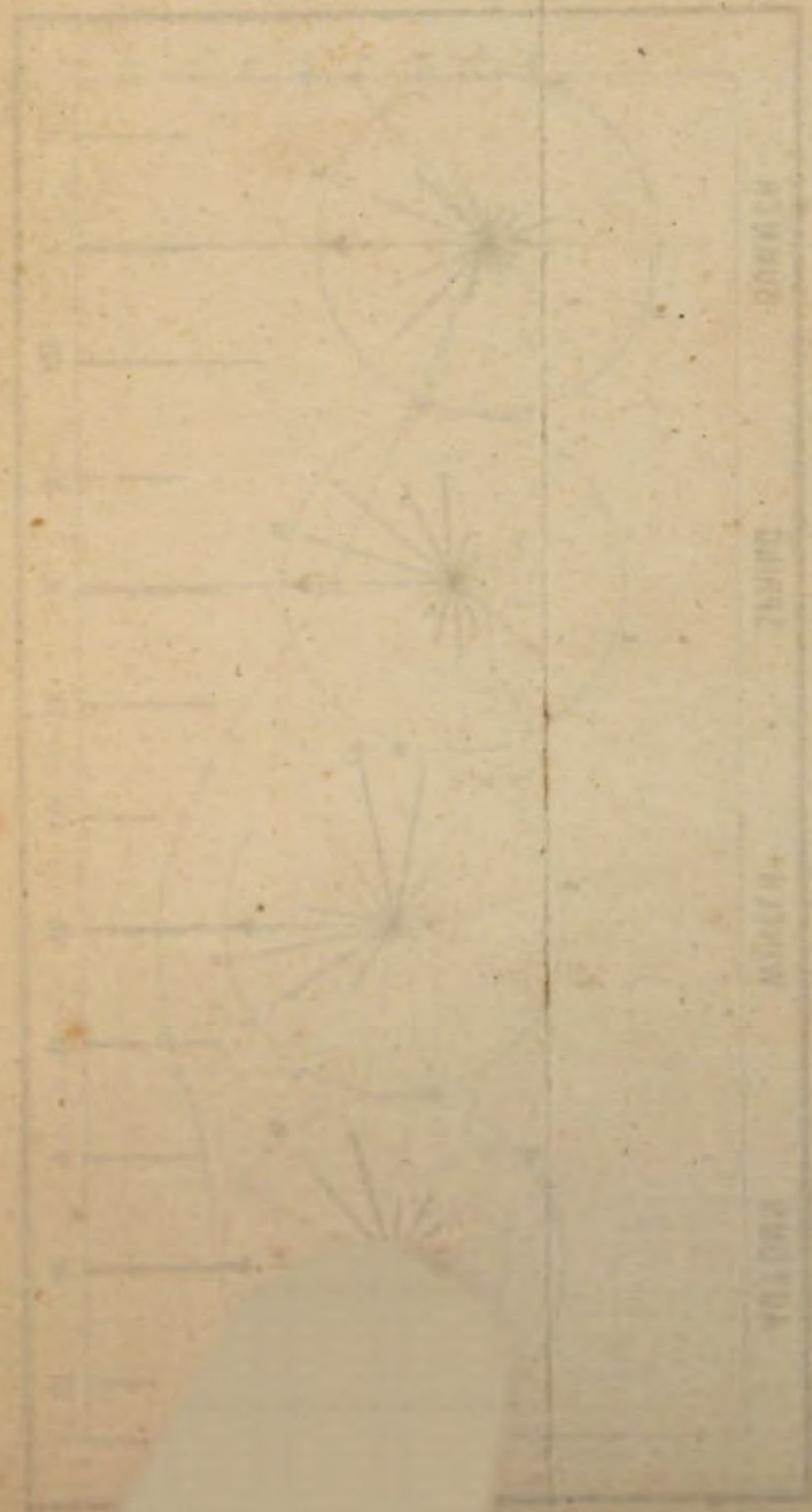
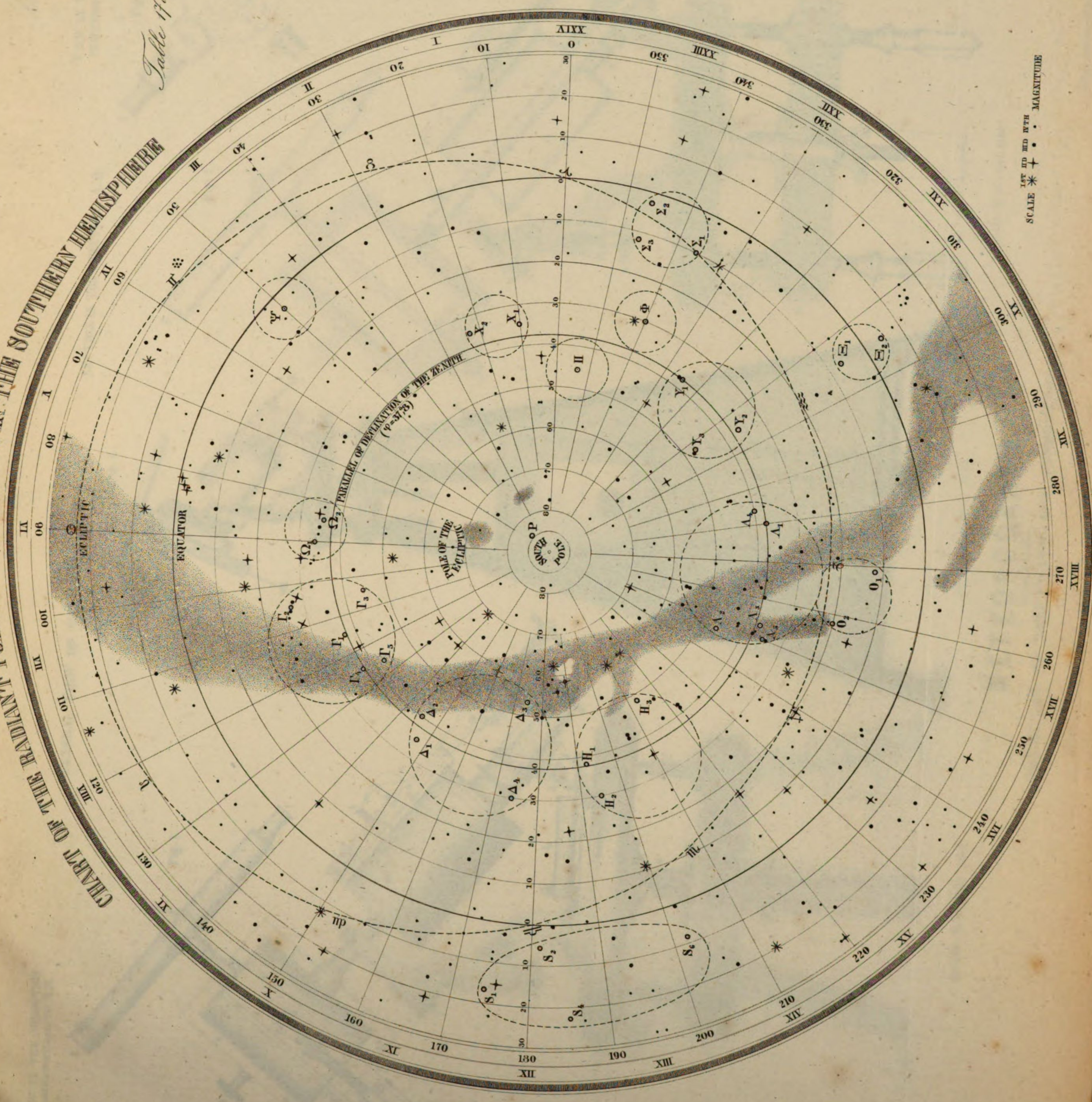


Table 17a (21)

CHART OF THE RADIANT POINTS FOR METEORS IN THE SOUTHERN HEMISPHERE



SCALE * + . . . MAGNITUDE
1ST 2ND 3RD 4TH

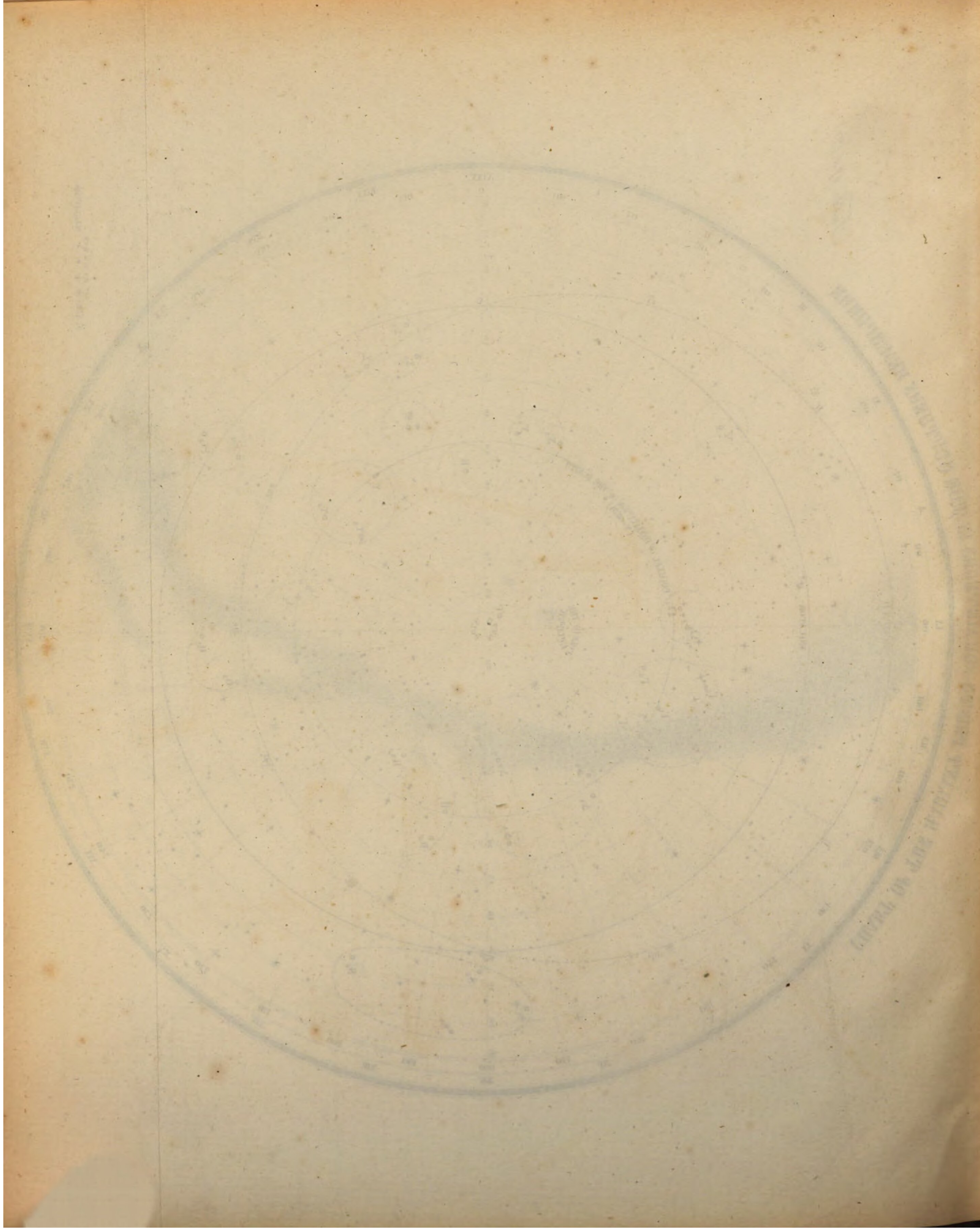


Table 176(22)

VIEW IN THE DIRECTION
PERPENDICULAR TO A.B.

GENERAL VIEW OF THE INSTRUMENT

VIEW IN THE DIRECTION
PERPENDICULAR TO C.D.

SECTION IN THE DIRECTION A.B.

Fig. 4.

Fig. 3.

Fig. 1.

Fig. 2.

Scale: $\frac{1}{4}$ of real size

Scale: $\frac{1}{4}$ of real size

Scale: $\frac{1}{10}$ of real size

METEOROGRAPH

devised by the
DIRECTOR OF THE FLAGSTAFF OBSERVATORY

ГОРЯЧИЙ ВОДЯНОЙ
КАЛДАН

II / КОМПАНИИ ИЛИ ТОВАРА

ТЕХНИЧЕСКИЙ ЧЕРТЕЖ

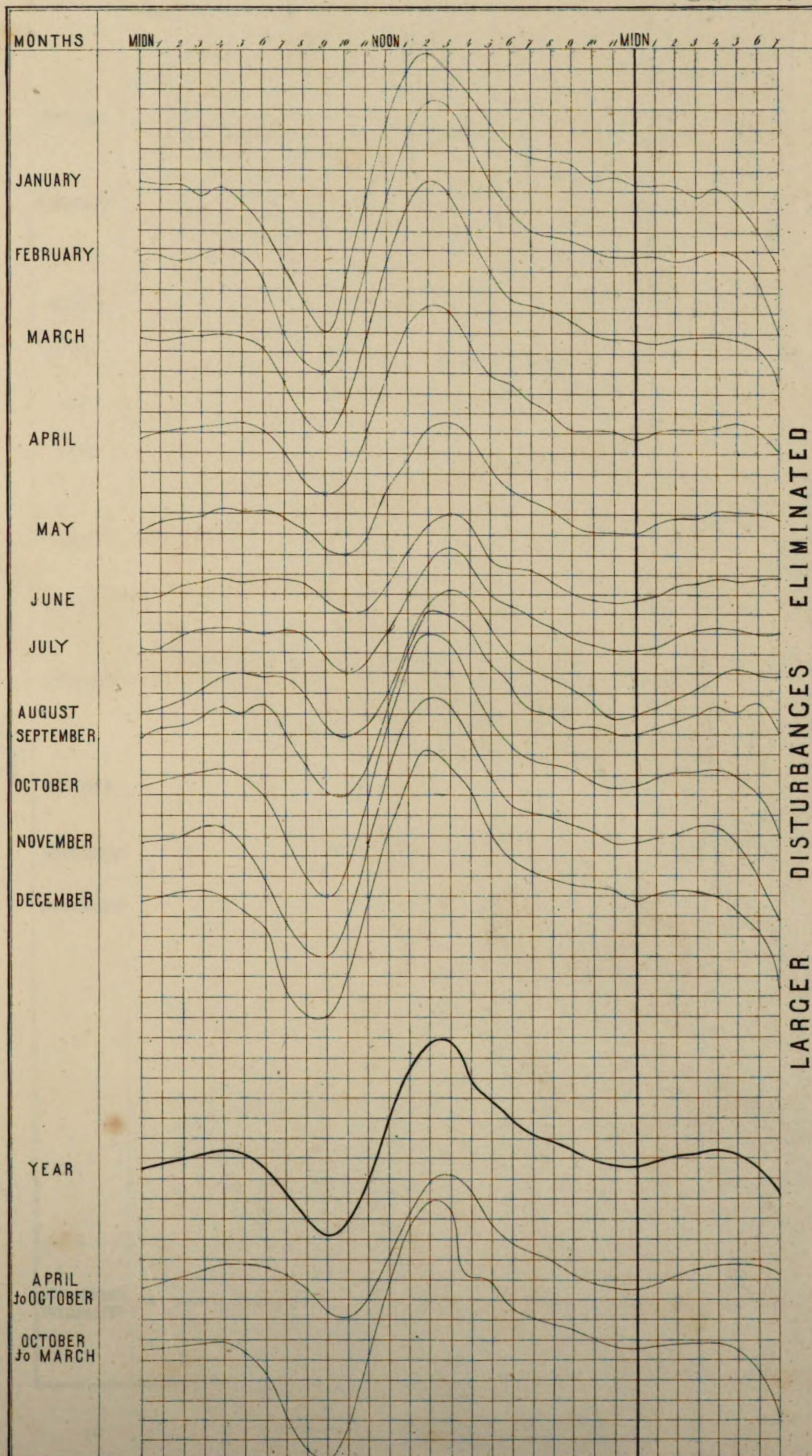
ГОРЯЧИЙ ВОДЯНОЙ
КАЛДАН

НАНДРОСТЯН

MEAN HORARY VARIATION OF THE MAGNETIC DECLINATION

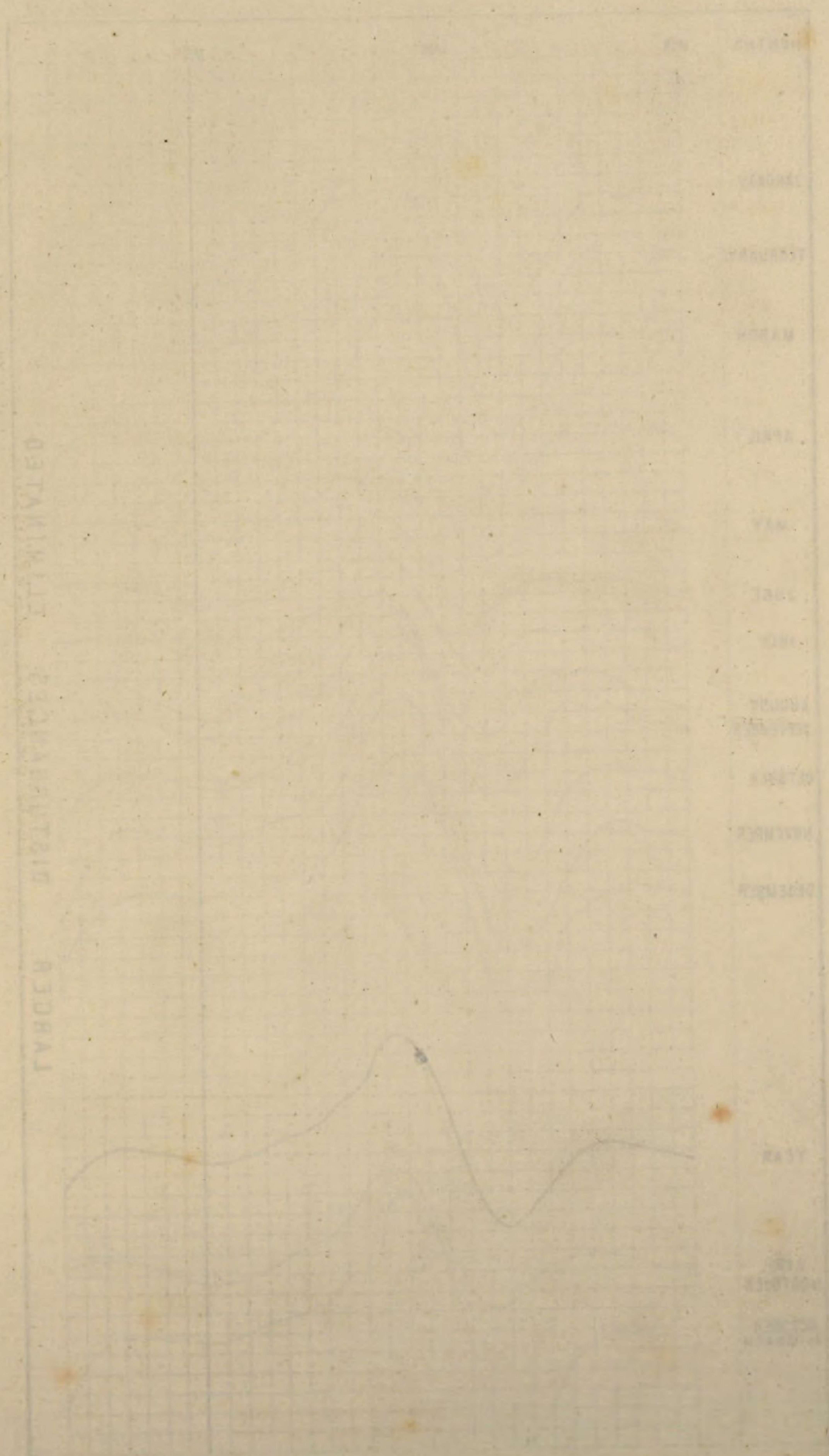
1858 — 1863

Table 18.



MEAN HOURLY VARIATION OF THE MAGNETIC DECLINATION

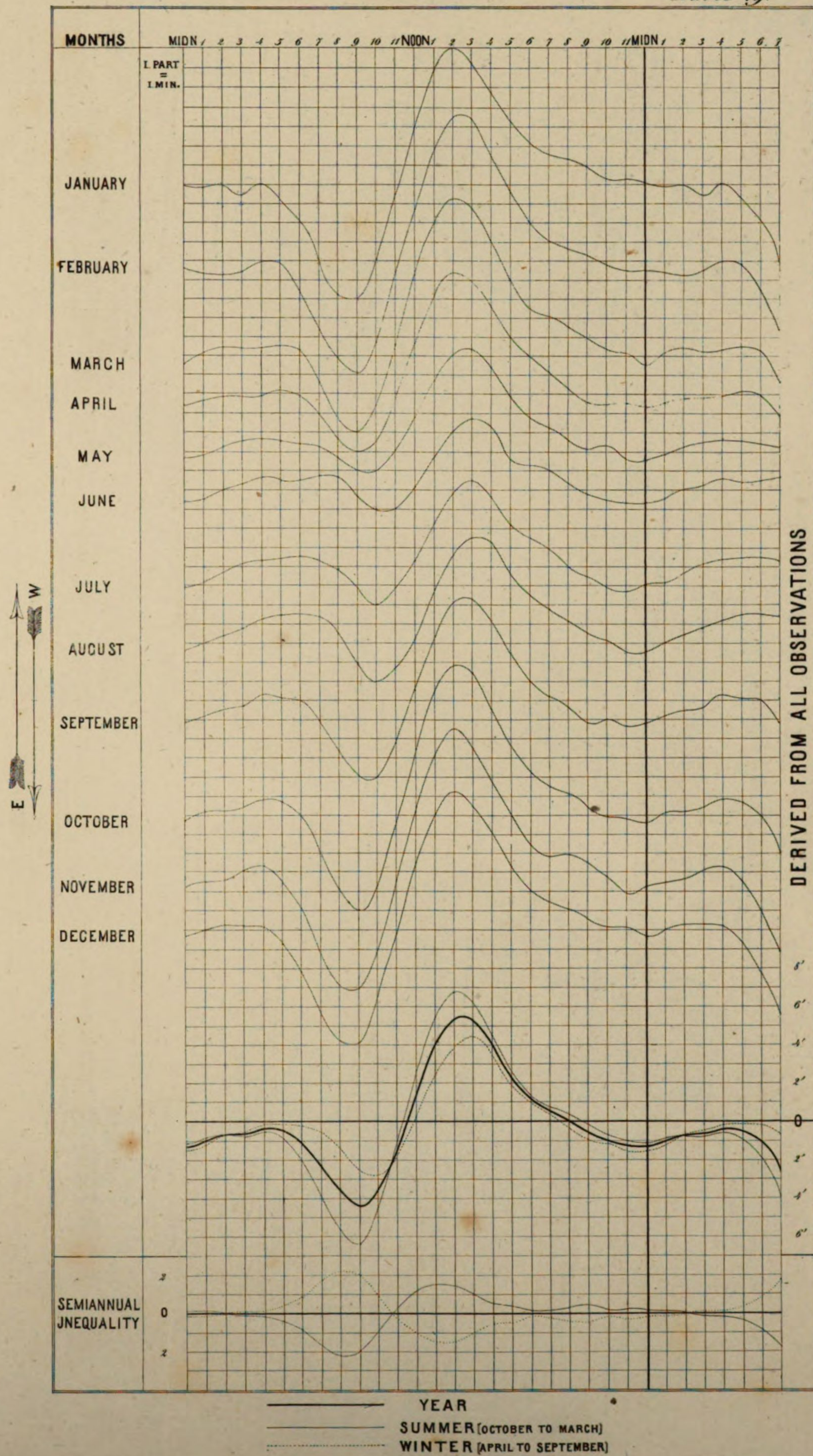
1898-1903



MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION

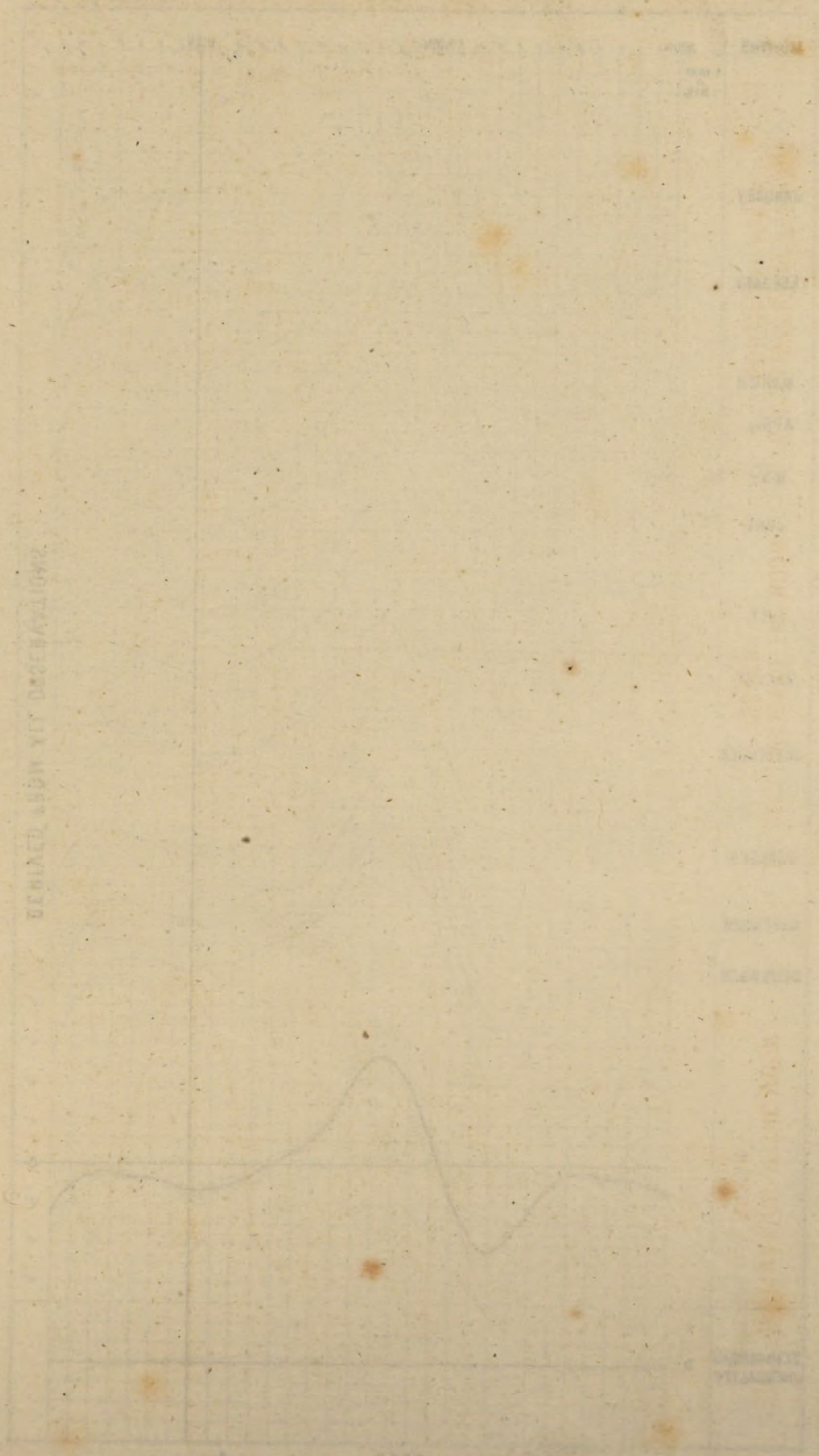
1858 — 1863

Table 19.



MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION

1881 - 1882



DECLINATION IN MINUTES

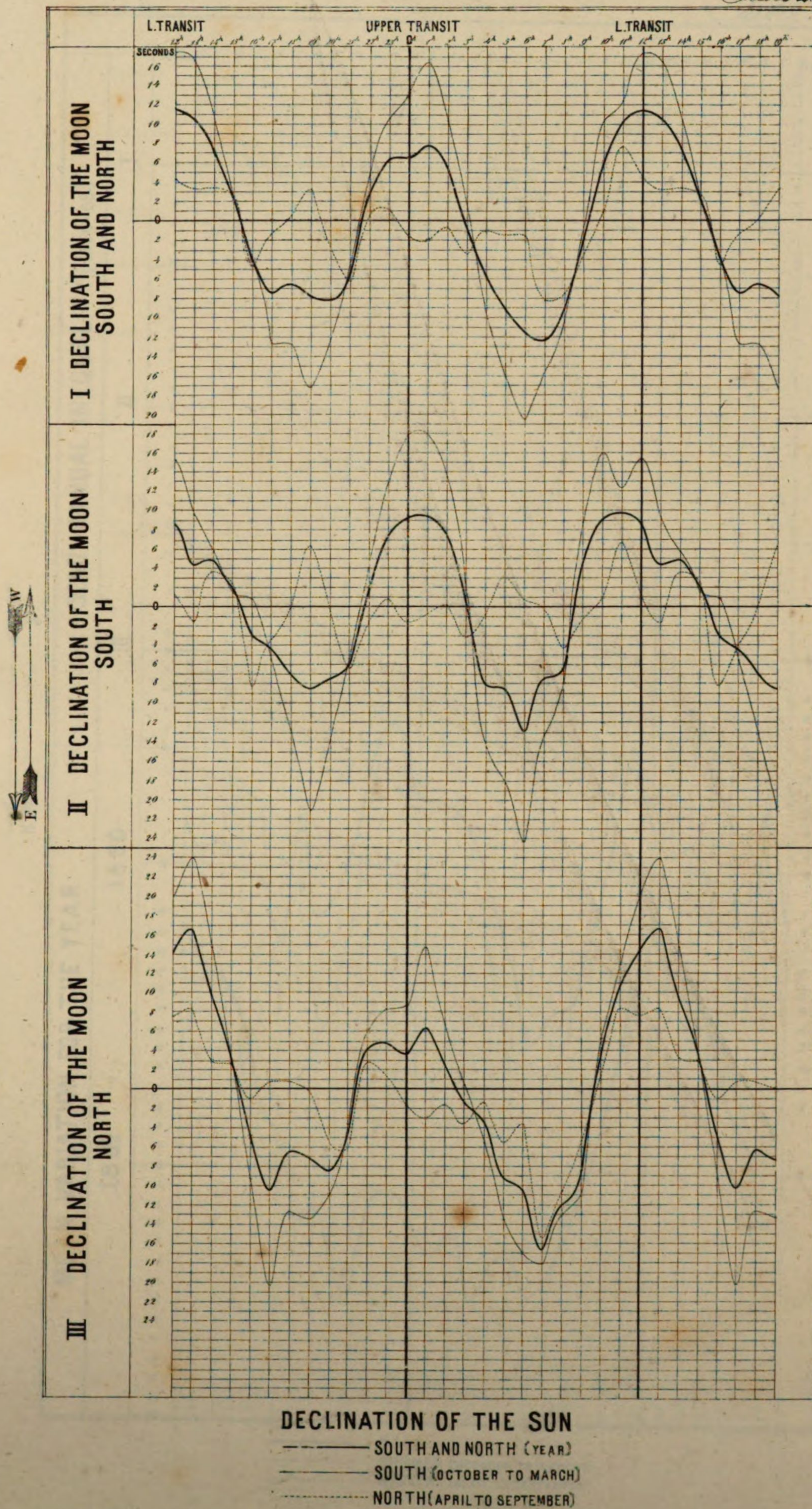
HOURS

MEAN SOLAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION
1881 - 1882

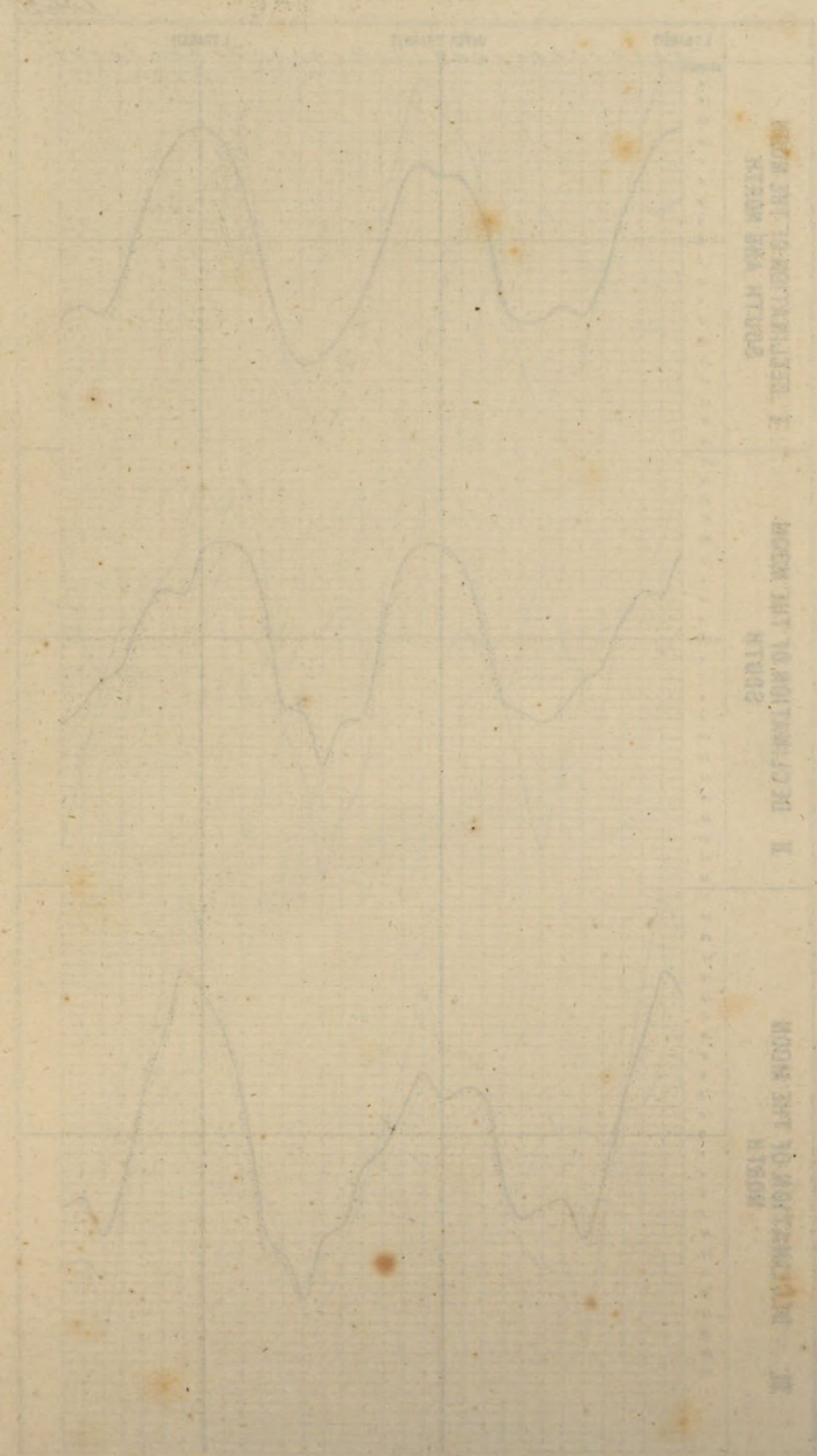
CURVES SHEWING THE LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION

1858 — 1863

Table 20.



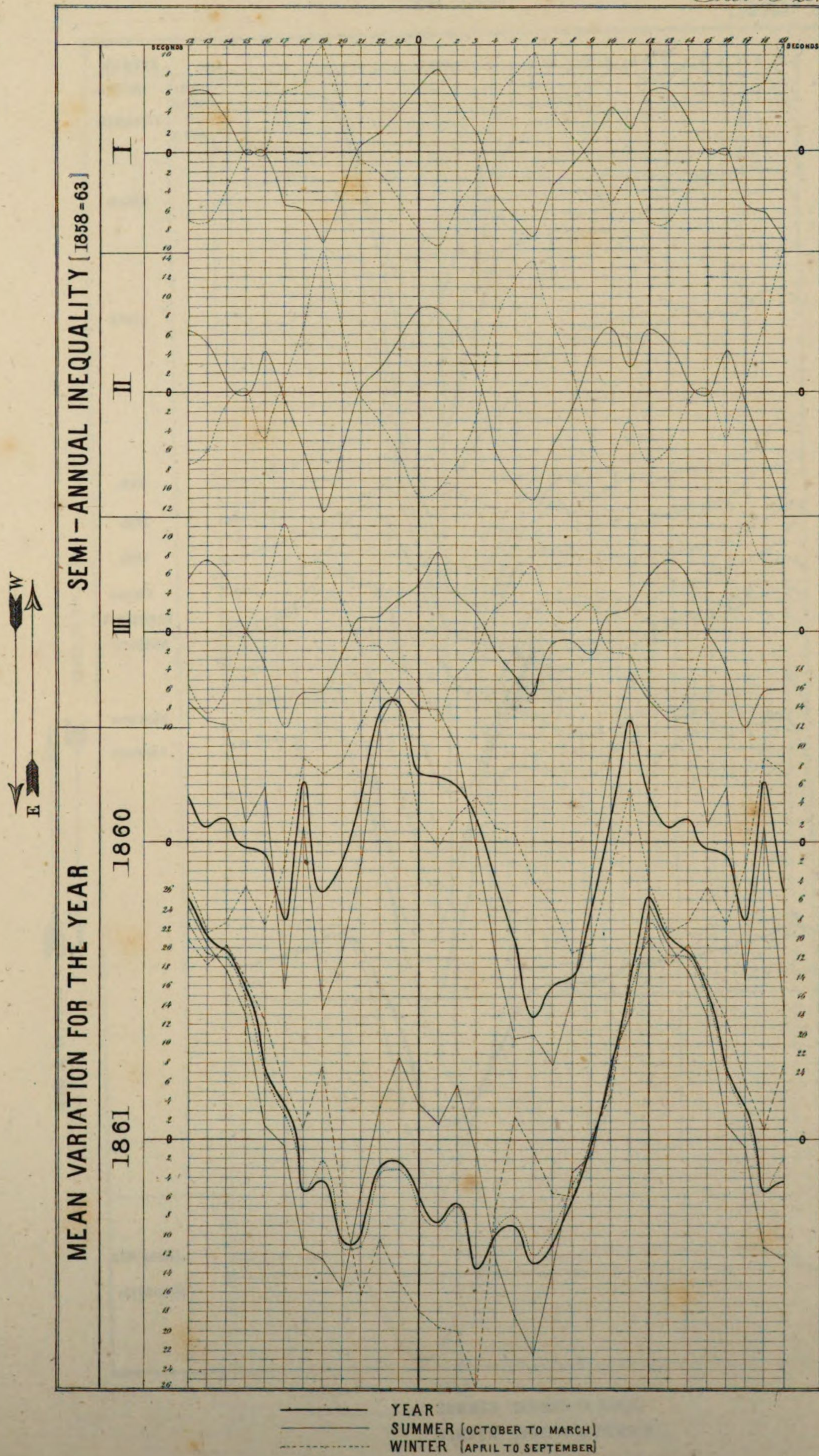
LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION CURVES SHOWING THE 1900-1901



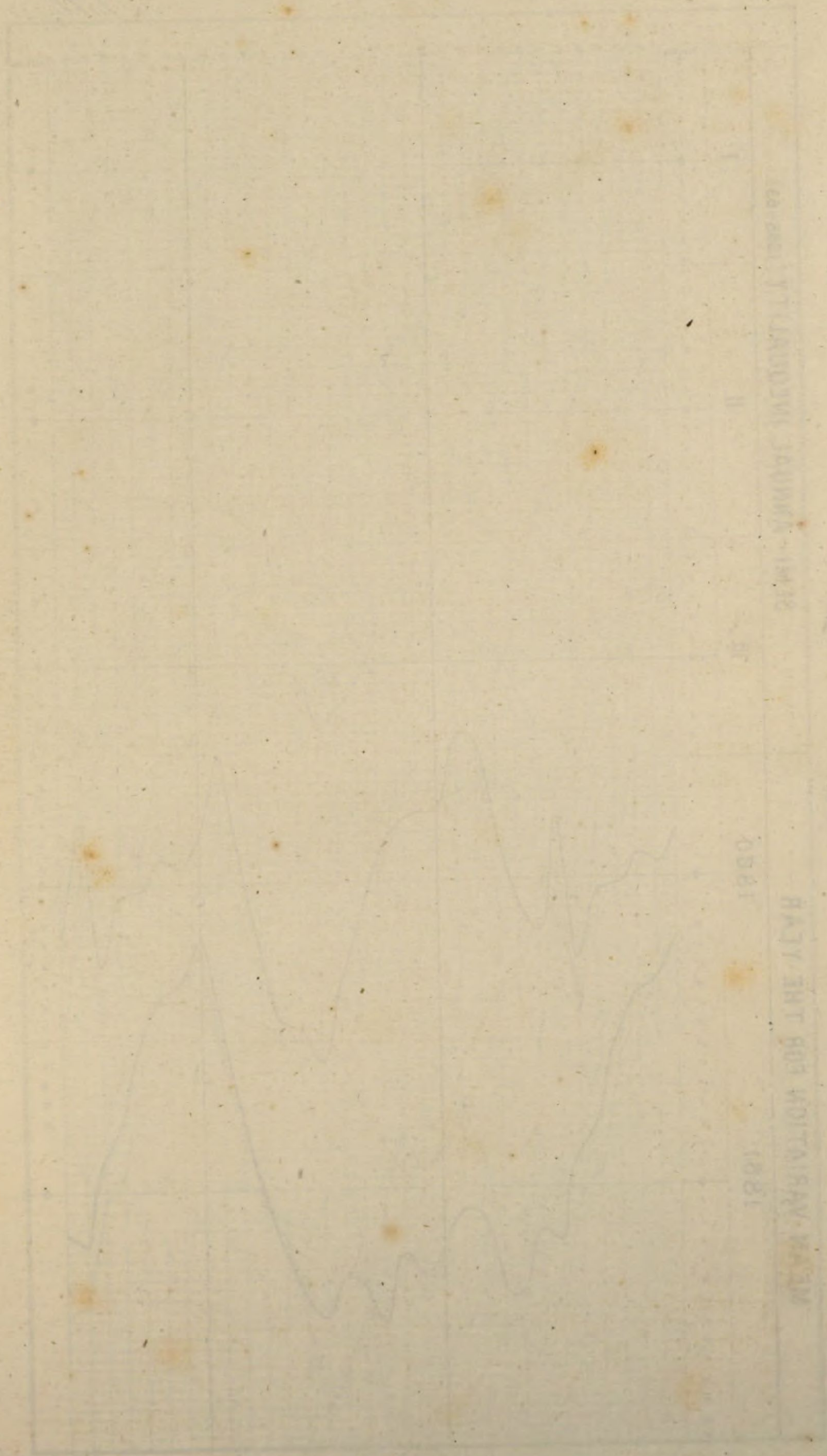
DECLINATION OF THE SUN
 NORTH STATION
 SOUTH STATION
 MEAN STATION

LUNAR DIURNAL VARIATION OF THE MAGNETIC DECLINATION

Table 23.



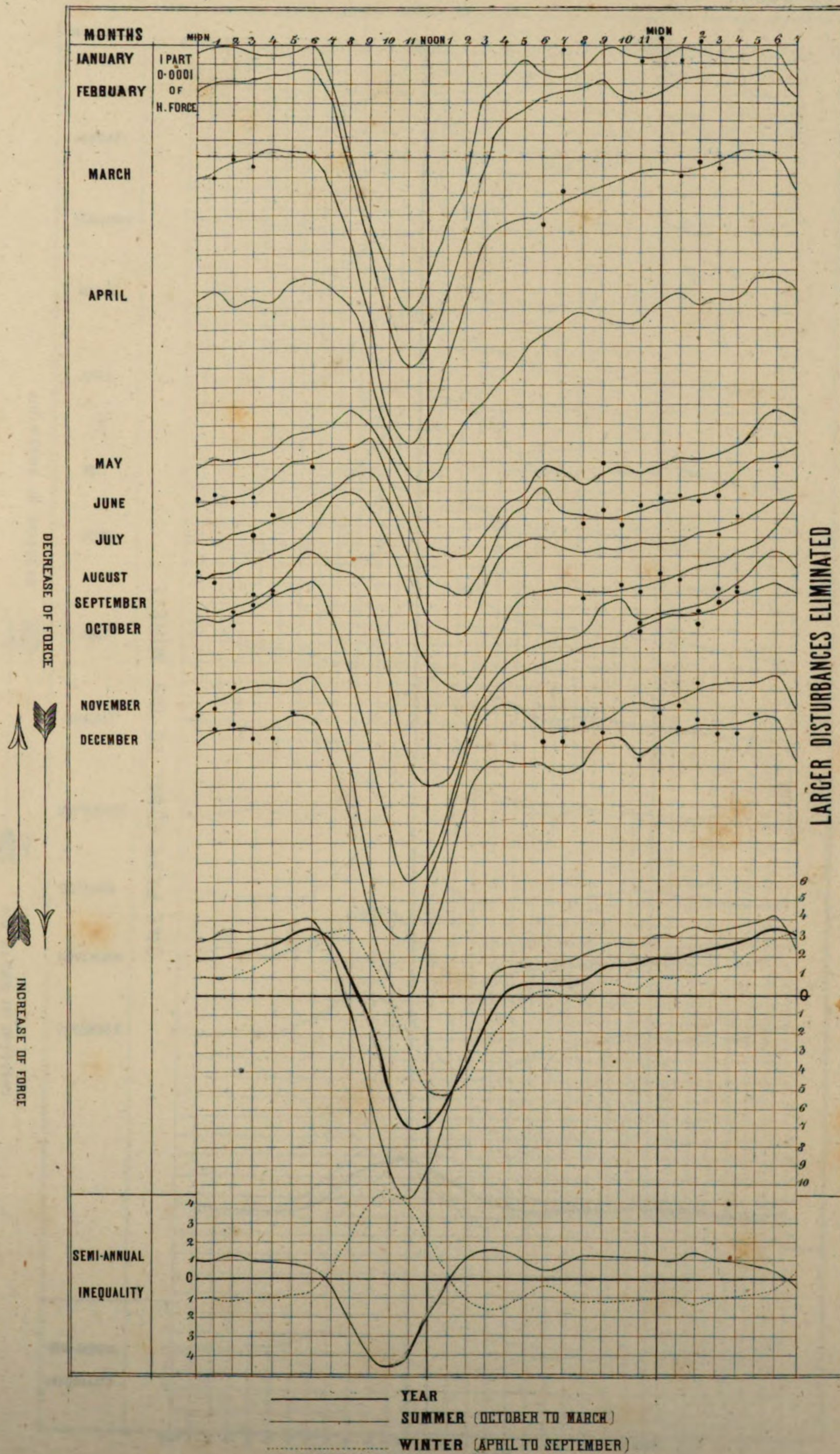
MONTHLY VARIATION OF THE MAGNETIC DECLINATION



CURVES SHEWING THE MEAN HORARY VARIATION OF THE HORIZONTAL INTENSITY

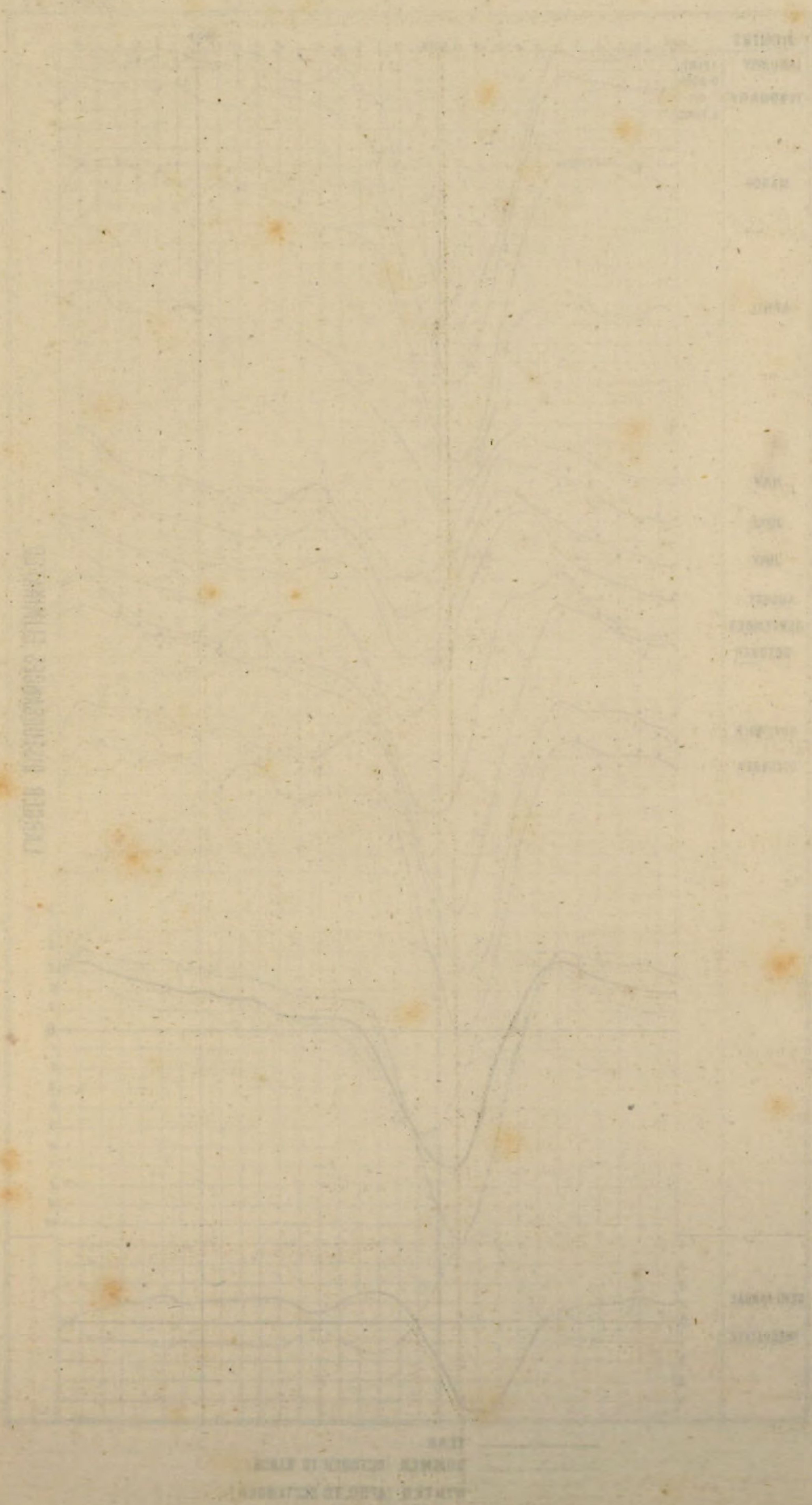
1858 - 1863

Table 24



REPORT ON THE PROGRESS OF THE WORK DURING THE YEAR 1900

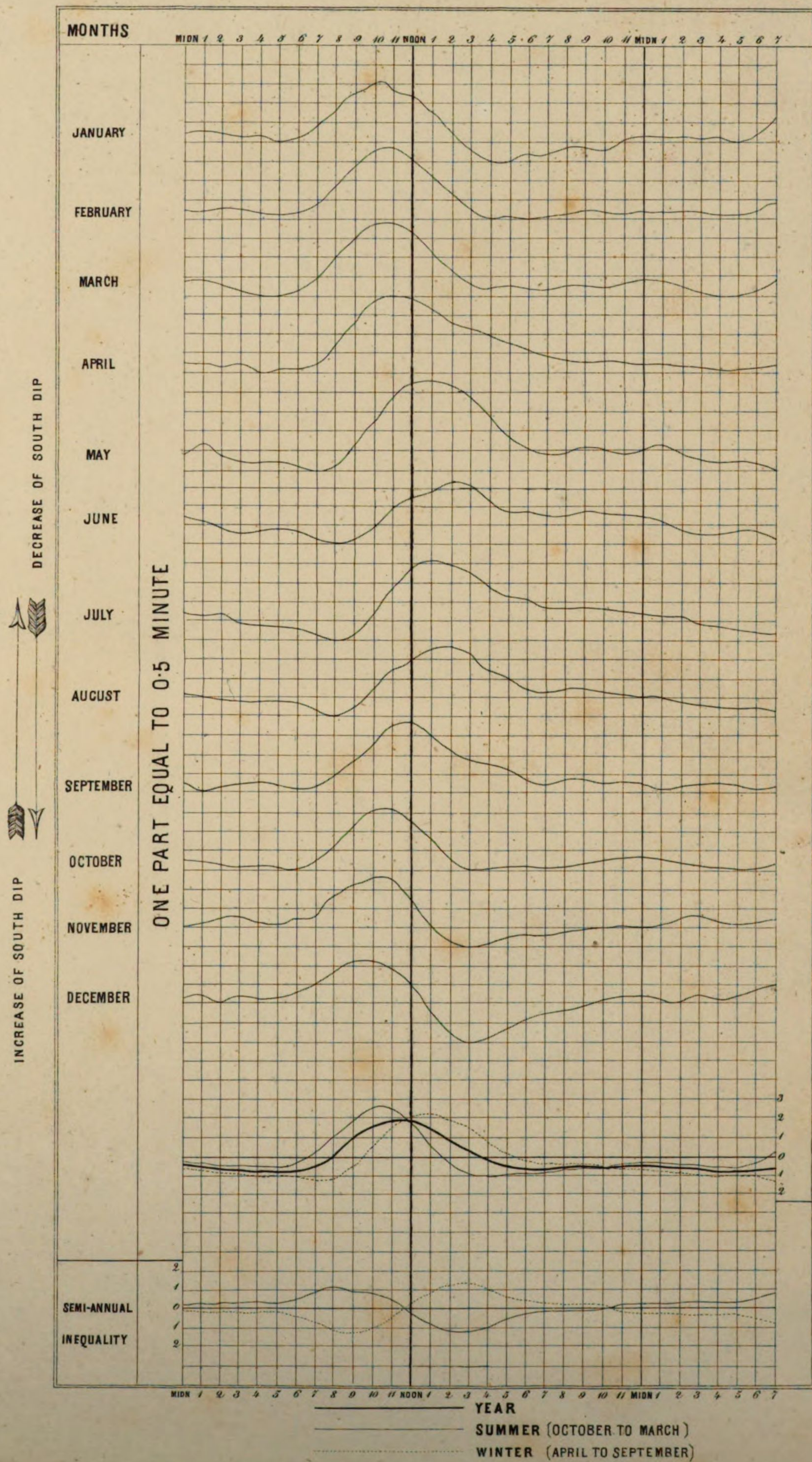
1901 - 1900



CURVES SHEWING THE MEAN HORARY VARIATION OF THE MAGNETIC INCLINATION

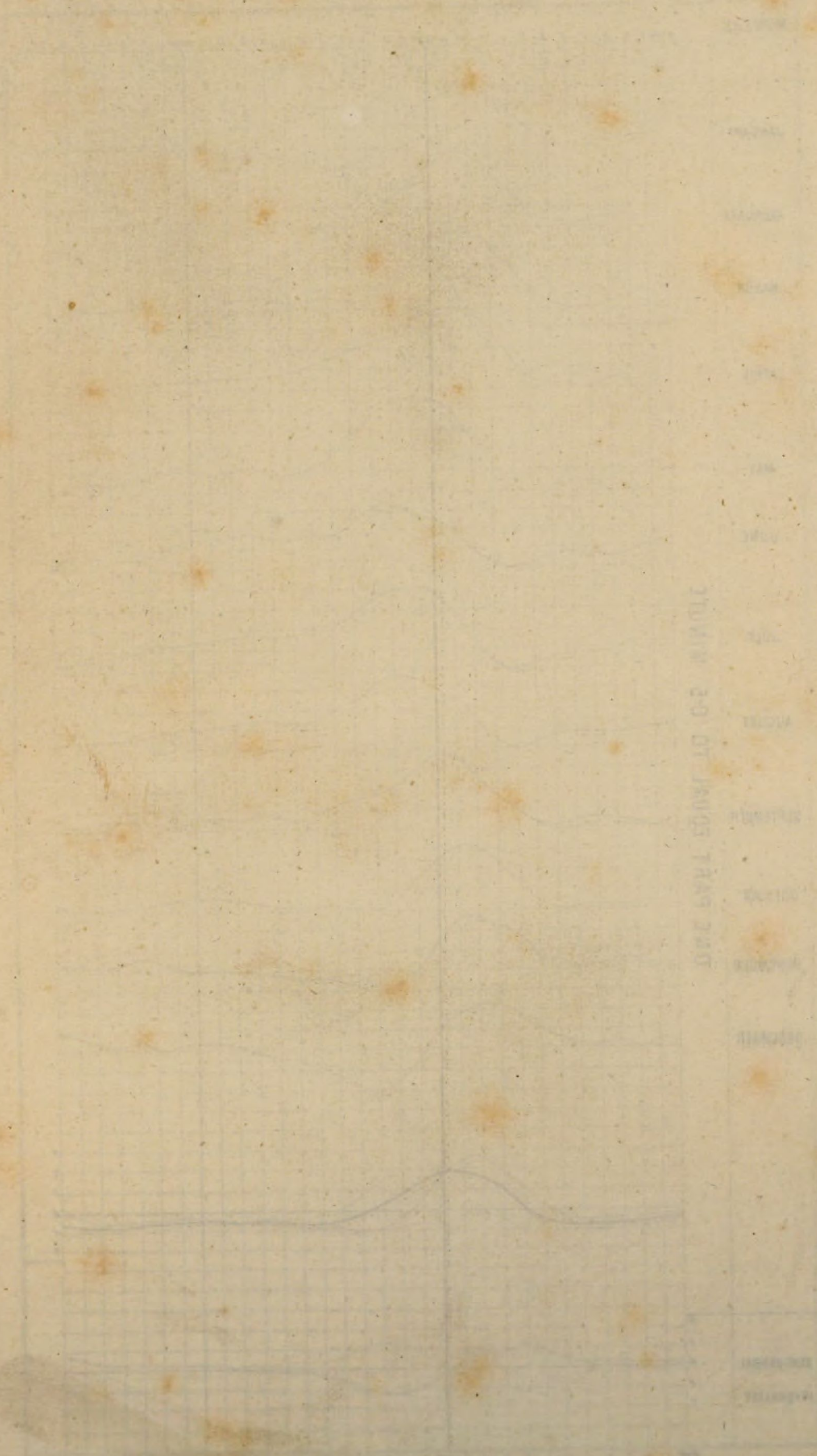
1858 - 1863

Table 25.



MEAN HOURS VARIATION OF THE MACHINE IN INCLINATION

1887



Neumayer, Georg <<von>>

Discussion of the meteorological and magnetical observations made at the
Flagstaff Observatory, Melbourne, during the years 1858 - 1863

Mannheim 1867

2 Phys.sp. 18 n-3

urn:nbn:de:bvb:12-bsb10944324-9